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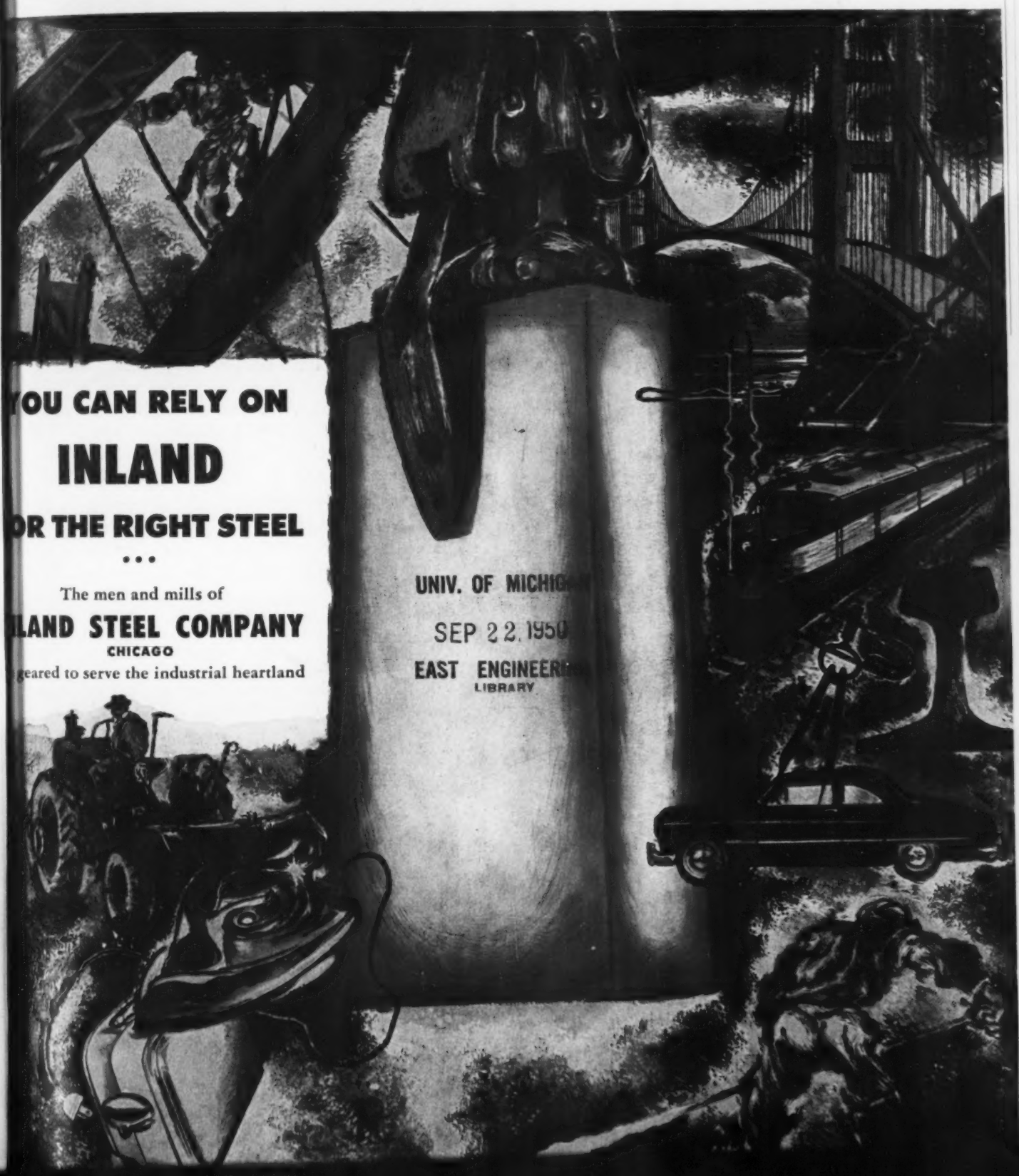
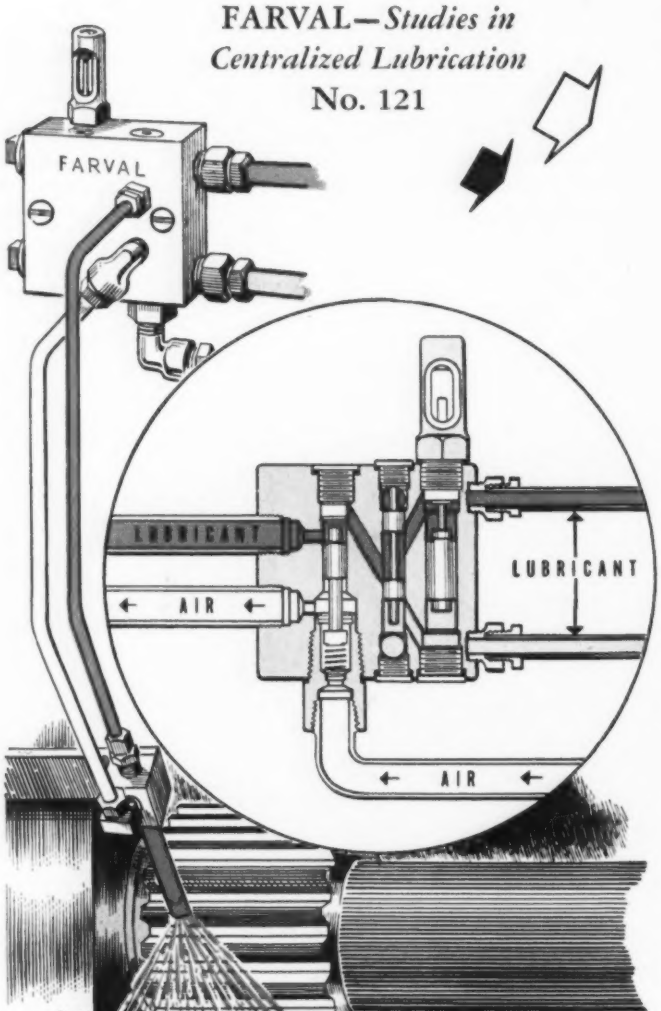
THE IRON AGE

THE NATIONAL METALWORKING WEEKLY September 21, 1950



FARVAL—*Studies in Centralized Lubrication* No. 121



When you attend the Iron and Steel Engineers Show at Cleveland Public Auditorium, Sept. 26-29, be sure to stop at Farval Booths 244-245-246 to see this new Spray Valve in operation.

New Farval Spray Valve

meters lubricants to slide surfaces and open gearing

CONTROLLED spraying of lubricant on open gearing, slide surfaces, etc., is practical with the new Farval Spray Valve.

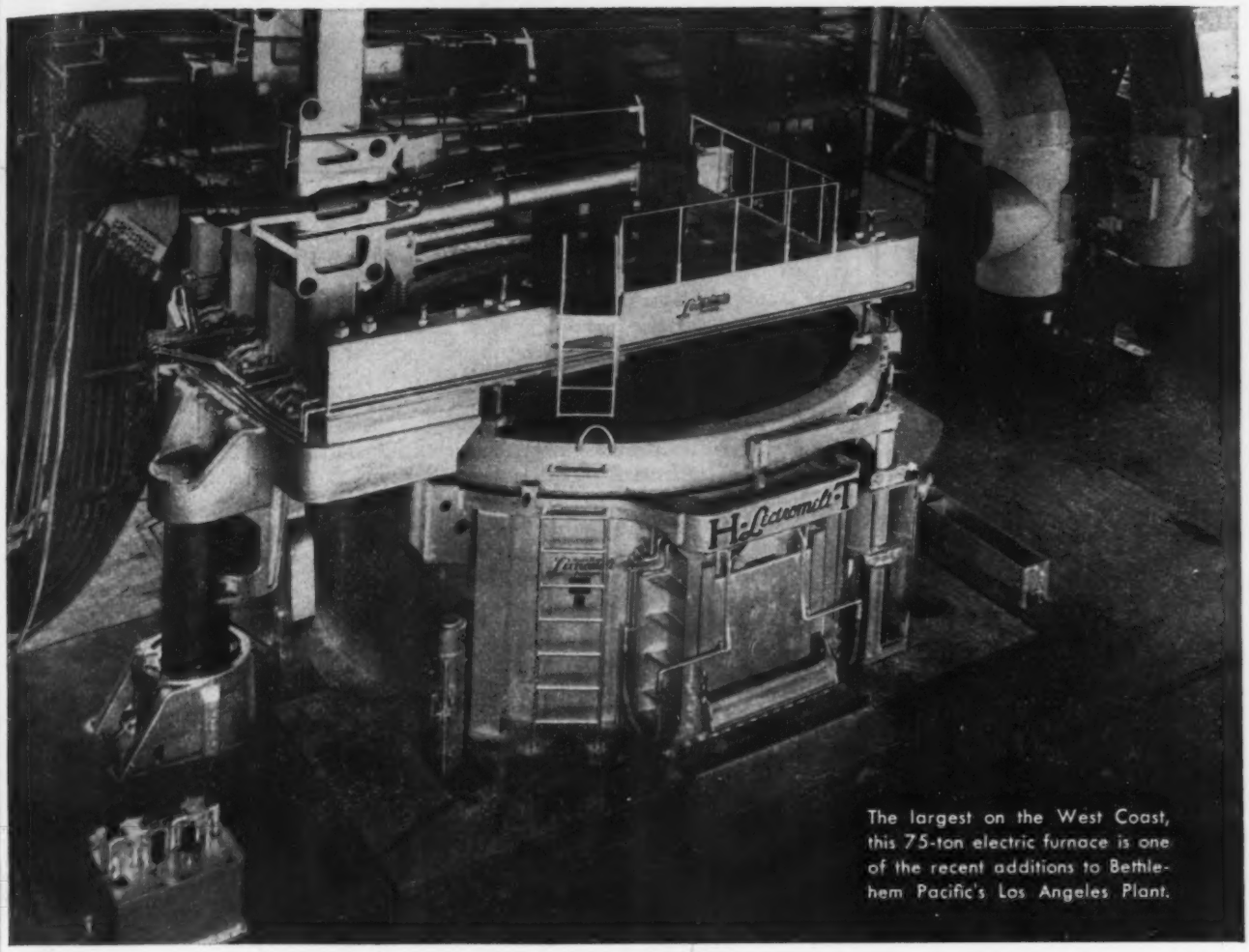
By an ingenious adaptation of the familiar Farval Dualine Valve, either grease or oil is sprayed through a nozzle—on any desired area, in any desired amount, and at any desired interval. The new spray valve can be added at any point in a regular Farval Dualine System where compressed air is available—or a complete system may consist entirely of spray valves, served by either manual or automatic pumping unit.

Compressed air from the supply line is directed through the spray valve, which meters air to the delivery nozzle just as lubricant is metered. By a unique arrangement, the lubricant valve also turns on and shuts off the air. Thus the quantity of air used is limited to the amount needed to spray each delivery of oil or grease, without exhausting or reducing pressure. Positive cut-off of lubricant by the Farval valve after each delivery eliminates bleeding from the nozzle—no waste, no mess, no trouble.

The Farval Spray Valve has been thoroughly tested in service and is now in use on a wide variety of machines and equipment. It has demonstrated its ability to supply lubricant efficiently and economically to open gearing, slide surfaces, in fact, wherever a standard Farval Dualine closed system is not readily adaptable.

Write for a copy of Farval Spray Valve Bulletin No. 60 for a full description, with illustrative diagrams and installation data. The Farval Corporation, 3252 East 80th Street, Cleveland 4, Ohio.

Affiliate of The Cleveland Worm & Gear Company, Industrial Worm Gearing. In Canada: Peacock Brothers Limited.



The largest on the West Coast, this 75-ton electric furnace is one of the recent additions to Bethlehem Pacific's Los Angeles Plant.

STEEL CAPACITY INCREASED AT LOS ANGELES PLANT

THE steelmaking capacity of Bethlehem Pacific's Los Angeles Plant has been stepped-up by the recent installation of a 75-ton electric furnace.

This addition provides the plant with some of the nation's most modern and efficient production equipment to supply the steel for its finishing mills. These mills process the steel into such products as bars, rods, wire, angles, miscellaneous sections, bolts, nuts and special fastenings for a wide variety of industries in the West.

Operations at the Los Angeles plant are closely coordinated with those of the other Bethlehem Pacific steelmaking plants and fabricating works on the West Coast. All are directed by an organization whose aim is to produce more high-quality steel products for the expanding industries of the region.

BETHLEHEM PACIFIC COAST STEEL CORPORATION

Steel Plants: Los Angeles, South San Francisco, Seattle. *Structural Steel Fabricating Works:* Los Angeles, South San Francisco, Alameda, Seattle

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THE IRON AGE

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September 21, 1950 • • • Vol. 166, No. 12

Special AISE Issue

Japanese openhearth design eliminates front walls, arches and buckstays. Much faster scrap charging is possible. Operating costs per ton have been reduced.—p. 85.

Three British carbon-lined blast furnaces have minimized breakouts and reduced scabs and scaffolding. Linings have stood up well and production has increased.—p. 88.

American blast furnace design would use carbon lining inside a welded gas-tight tank. Shower-cooled furnace has greater volume because of thinner carbon lining.—p. 92.

Investigations show that optimum scrap handling and charging depend upon definite "shape ratios." Bundling presses give handling ease and good bulk densities.—p. 95.

Issue Highlights

Phil Murray's steelworkers are going to get some kind of raise in pay before long. Steelworkers are gunning for raise of 23¢ an hr, but a big boost would mean higher prices.—p. 105.

The Bituminous Coal Operators Assn. has finally been formed, with Harry M. Moses as its chief. Move is aimed at achieving stability and harmony within the industry.—p. 107.

The allocation program of the National Production Authority is making haste slowly. A schematic flow chart shows delegation of authority so far made.—p. 111.

Of vital interest to all manufacturers is the inventory control order issued by NPA head Harrison. Items affected by the order are listed.—p. 114.

Coming Next Week

Two years' experience with synthetic core binders and electronic core baking shows higher quality, lower cost. than with oil-fired baking. Savings on binder materials exceed $4000 yearly. Savings also come from faster core baking and lower heating costs.

Indexed in the Industrial Arts Index and the Engineering Index. Published every Thursday by the *CHILTON CO. (INC.)*, Chestnut and 56th Sts., Philadelphia 39, Pa. Entered as second class matter Nov. 8, 1932, at the Post Office at Philadelphia under act of March 3, 1879. $8 yearly in United States, its territories and Canada; other Western Hemisphere Countries $15; other Foreign Countries $25 per year. Single Copies 35¢. Annual Review Number, $2.00.

Editorial

INDUSTRY VIEWPOINTS

The Undisclosed Enemy

ABOUT a week ago a friend of mine came home tired out. The kids had the guns, tanks, men and other war materials all over the place.

After grunting "Hello fellows," and neatly sidestepping what might have been a broken collar bone, my friend sat down.

Pretty soon he noticed that a war was going on. But there was a great difference between this and other wars his boys fought. Others have brought jangled nerves, noise, bloody noses and a general blowing of the old man's top.

Finally he could stand it no longer.

"Say fellows, are you two fighting a war?"

"Yep," said both.

"Well," said my friend, "why all the politeness? Why aren't you kicking each other around like you always do?"

"Well, Pop, here is how it is. We don't want to get in trouble with you and Mom so we are fighting an 'undisclosed' enemy."

"Come again," said the old man flabbergasted.

"Well, Pop, we are really fighting each other but by calling each other an 'undisclosed' enemy we can do it politely," said the older one.

My friend thought for awhile then stiffened. Wasn't that like the United States and Russia?

Everyone in the country knows we are fighting the Russians except the President and his cabinet, when they talk in public, and those military who are allowed to talk—officially.

The politeness has been sickening. The Russians accuse us of everything under the sun but we use nice phrases—aggression, incident, police action, enemy. But never does our government admit who—by name—is our real enemy.

It's about time that we quit this powder puff diplomacy. We aren't kidding anyone—least of all the Russians. Even my friend's kids know who furnished men, money, tanks, high octane gas, training and food to the North Koreans.

Maybe there are good reasons why Mr. Truman and Mr. Acheson don't call a spade a spade. The best reason given so far is we don't want to get the Russians mad.

Shades of Teddy Roosevelt! Let's cut it out and talk like Americans.

Tom C. Campbell

Editor

Here's what we mean by "One-Punch Production"

NEWSFRONT

NEWS, METHODS AND PRODUCT FORECAST

► Several top-notch industrialists who have access to special sources of information have changed their minds about Russia. A few months ago they felt that the Soviets were not ready for war. Now they are not sure. And they are worried about the "business as usual" attitude in Washington.

► In their procurement offices in Washington high ranking military men are daily pointing out to industrialists that there is no war now, no emergency declared. But privately they are telling those they know well that they are worried sick at the lackadaisical attitude of the Administration.

► Some steel leaders privately think that voluntary controls on steel will not work unless the war picture changes materially. A few even believe a Controlled Materials Plan, slightly modified, should be put into the planning stage now. Behind thinking of these men is knowledge that present planned needs will grow and that everyone will want everything at once.

Best guess is that voluntary allocations will have to run several months to get things started before the more complicated machinery of a CMP can be set up.

► A West Coast airframe manufacturer has found a way to minimize the distortion he was experiencing in machining 75ST aluminum. Two steps were involved. One was to have the mills reduce the amount of cold work in leveling and stretching; the other was to change the sequence of machining operations.

► There is a bare chance that steelworkers will get a raise without a price rise in steel. But there is a big if. If the amount is small there may be no price increase. If it is large, steel must ask for higher prices. Murray is thinking of 23¢ or so. Considering what has happened in Detroit, there are some who would not be surprised if he gets a boost.

To prevent steel and other labor from being behind the parade the government is not likely to freeze wages until major unions get under the wire.

► A Pittsburgh district company plans to build an improved version of a foreign roll turning lathe which will remove metal at the rate of about 1 ton per hr. It will handle rolls up to 30-in. diam and 33 ft long. Other claimed advantages of the design include quick tool change, adaptability to contour machining and automatic chip removal.

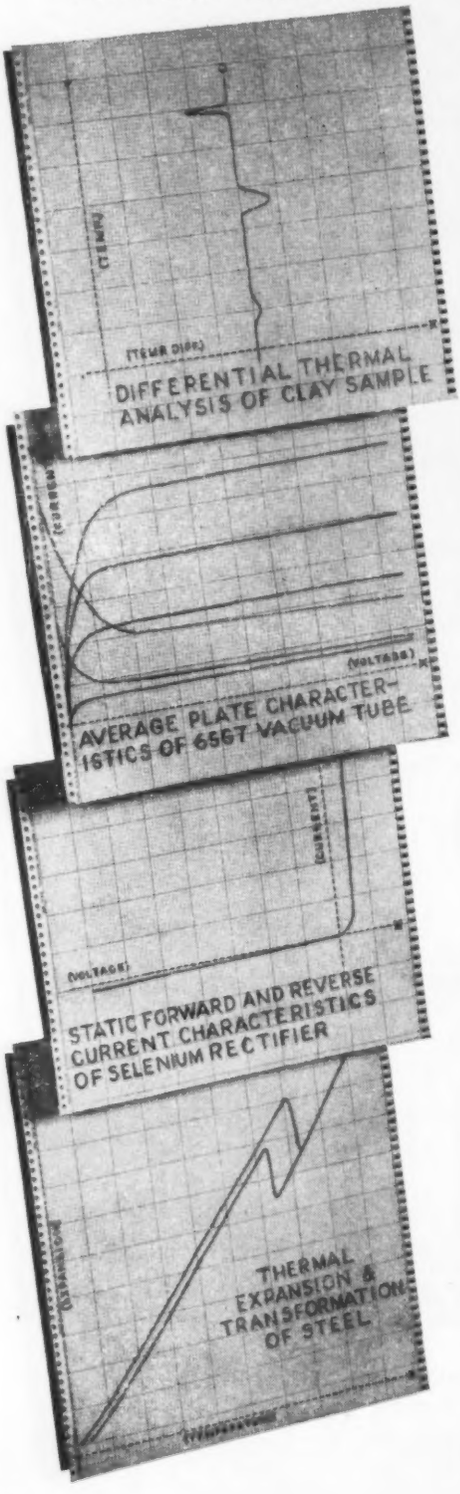
► The Navy is investigating a portable 50-hp gas turbine driven fire pump. It weighs 1.2 lb per hp against 3.7 lb per hp for the gasoline engine now used. An important factor is that it burns a low volatile non-explosive fuel.

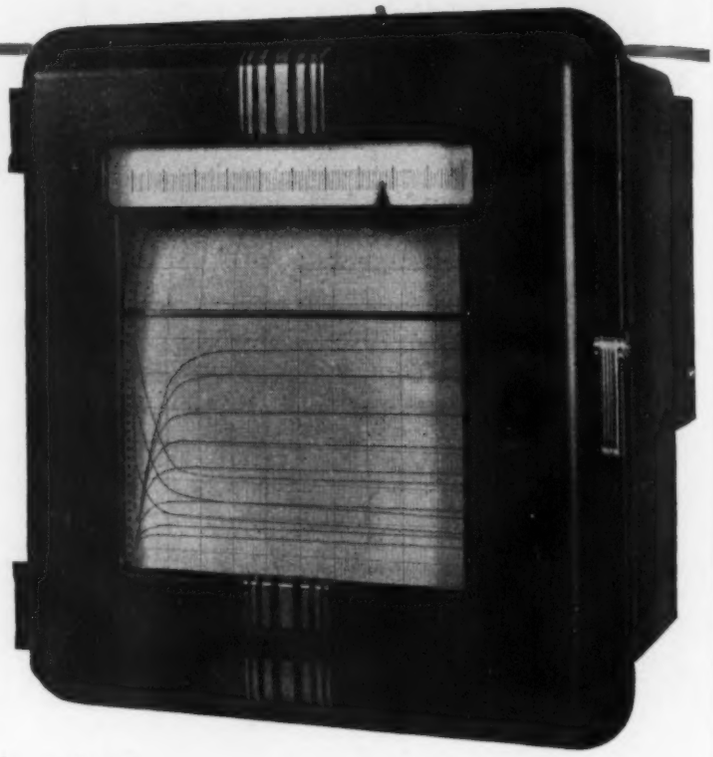
► About 15 manufacturers of automotive equipment now are scheduled to participate in the Army's new armored car procurement program. General Motors, International Harvester, and Continental Motors are in this group of prime contractors. Dozens of subcontractors are slated to get a piece of the big buying program through their contacts with the basic manufacturers.

► The Navy expects to save $5000 yearly in electroplating shops under control of the Bureau of Aeronautics by using technical grade hydrogen peroxide in lieu of the chemically pure grade, as suggested by a Corpus Christi chemist.

Now you can plot X vs. Y...automatically

TYPICAL CURVES





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Boon to engineering and research laboratories, this new Speedomax Recorder automatically plots a continuous, accurate curve showing the relationship between any two variables brought to the instrument in the form of d-c signals. Gone are those hours of tedious compilation and point-by-point plotting of data.

Just glance at these typical curves and note the instrument's remarkable versatility. Its big 10" chart provides remarkably complete detail. Potential applications are as broad as a researcher's imagination.

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For details, send for Folder EM9-420(1). Write us at 4956 Stenton Ave., Philadelphia 44, Pa.

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MEASURING INSTRUMENTS · TELEMETERS · AUTOMATIC CONTROLS · HEAT-TREATING FURNACES

LEEDS & NORTHRUP CO.

Steelworkers Will Get Raise

Sterner Controls Expected

Nickel Looms As Bottleneck

The Iron Age SUMMARY

IRON AND STEEL INDUSTRY TRENDS

THE wage increases by auto and other manufacturing companies have put pressure on all basic industries—especially the steel industry. Steelworkers will get some kind of an increase. How much it will be is pure guesswork now. But one large steel firm has already had informal discussions with Philip Murray, head of the United Steelworkers. Official negotiations will start about Nov. 1.

At least one big steel company would be willing to grant a slight wage raise without raising its steel prices, but the union will probably turn down a raise of around 5¢ an hour. It will go after a bigger cents-per-hour raise and will try to get pension payments increased, although the pension part of the contract is to run for four more years.

Only the Beginning

The final showdown on steel wages might reach the White House because a big wage increase would have to be accompanied by a steel price rise. The steel expansion program, raw material cost increases and a big wage increase would force all steel companies to charge higher prices for their products, despite the high rate of steelmaking.

In spite of all the talk and plans being made in Washington, steelmakers are still operating on a hit and miss basis to fill government and civilian orders. Many steel people feel that the voluntary allocations program will be only a warmup for complete government controls to be installed within a few months.

Defense orders requiring steel are growing in volume and tonnage. As they grow, regular customers making civilian goods are finding their quotas slashed and deliveries extended. Some fourth quarter quotas on sheets and plates have already been sliced 30 to 40 pct below third quarter quotas. Moreover, deliveries on these products are running 4 to 8 weeks behind schedule.

Other consumers report that their allotments are being juggled by the mills. While they may not be getting cut back too severely, they are not getting the sizes they originally ordered. When extended high speed operation causes a mill to break down, customers are asked if they can use the size produced on another mill. If they can the order is shifted.

May Change Steel Specs

Steel consumers and producers are both worried about nickel supplies. Before too long the nickel pinch may force some changes in specifications for steels containing nickel. Fantastic prices have been offered for nickel-bearing scrap but it is practically unobtainable.

Producers are sold out on stainless sheets, plates and bars for the rest of the year. One mill is booking orders for January and February 1951 for good customers with defense orders. But they expect to cut their allotments in the next 10 days because of the nickel shortage. Another company has advised its salesmen that they can take no more orders, unless they are for defense work.

Some producers of large diameter pipe report they are sold out through 1952. Another big producer is sold out through 1951 on pipe of medium diameter. Their allotment of plates has been cut back 25 to 30 pct and they will cut their production proportionately in October.

Ingot Rate Rises Again

Cold-rolled sheets are being sold in the gray market for $360 a ton, compared with a top of $260 a ton only 3 months ago. However, the tonnages are small and deliveries are not reliable.

Steelmaking operations are scheduled at 100.5 pct of rated capacity this week, up half a point from the previous week. Barring unforeseen trouble the industry is expected to keep operating at close to capacity in an effort to fill military orders without slashing orders of other customers any more than necessary.

(Nonferrous summary, p. 138)

ANOTHER Machine Tool Made Better with MEEHANITE® *Castings*

(Fig. 1)

The modern streamlined production tools like the Super Service Uprights (Fig. 1), manufactured by Cincinnati Bickford Tool Company, Cincinnati, Ohio, are built with many Meehanite castings. All of the truly *vital* castings are Meehanite metal. A few are illustrated.

In the manufacture and sale of a machine tool of this type it is a long road between the drawing board and the customers' production floor. The correct specification of proper materials for component parts to translate maximum design superiority into product superiority, is of major importance. That is why wherever quality products are built; where better engineering properties combined with uniformity and repeated dependability are required,—Meehanite castings are specified and insisted upon.

Take advantage of Meehanite engineering service—send your blueprints for analysis and specific recommendation to the foundries listed below.

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Continental Gin Co.	Birmingham, Alabama
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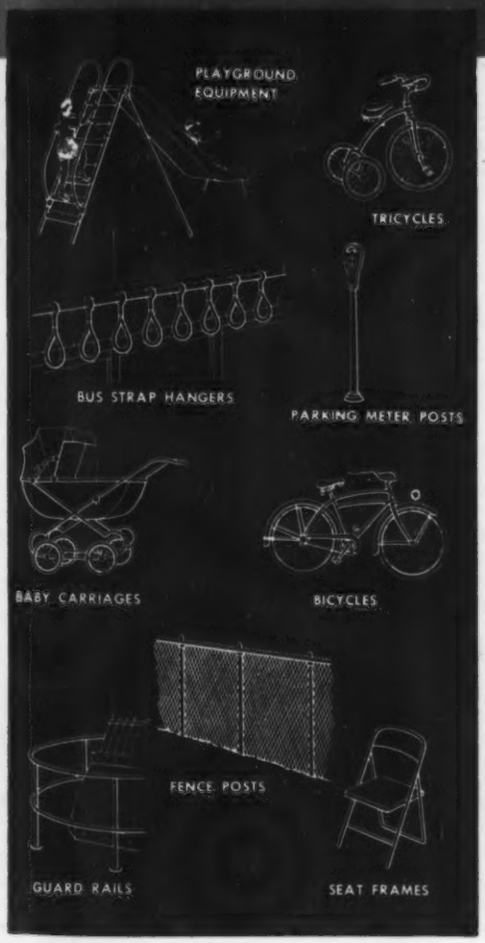

● In proportion to size and weight, a tube is the *strongest structural form you can buy*. That's why you find so much tubing where light weight with strength is important: in furniture and seat frames, bicycles, playground equipment, fence posts, guard rails and hundreds of other everyday items.

Look at these other features: Tubing is *stiff*, has high resistance to torsional and bending stresses. It's easy to transport, fabricate, and erect. Surface area is small, economical to apply paint and other finishes. In *permanent* installations, the light weight of tubing often permits lighter, cheaper and more easily erected substructures.

If you want tubing that has that unbeatable combination of quality and economy, specify NATIONAL Electric Welded Mechanical Steel Tubing. This low-cost commercial quality tubing is available in sizes up to and including 4" OD. It's easy to bend. Easy to form. Easy to weld. The high quality will keep production men and customers happy. And the low cost . . . that'll keep *you* happy!

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UNITED STATES STEEL EXPORT COMPANY, NEW YORK

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NATIONAL *Electric Welded* MECHANICAL STEEL TUBING

UNITED STATES STEEL

Dear Editor

Letters from Readers

Fan Mail

Sir:

In a recent letter to your office I asked for some tear sheets on precision casting articles which had been published in THE IRON AGE. I want to express my sincere thanks for the collection of articles, "Precision Investment Casting," which you sent me in return.

Your technical articles are a tribute to the efforts of your staff and I read them regularly. I make it a point never to miss the Newsfront, Tom C. Campbell's editorial, and Joseph Stagg Lawrence's "The Economic Side." Many thanks for printing a very helpful magazine.

C. A. MARCOWKA
A. O. Smith Corp.
Milwaukee

Unfortunately, "The Economic Side" has been discontinued because of Mr. Lawrence's death a few weeks ago.—Ed.

No Shortage Found

Sir:

On p. 91 of your Aug. 10 issue, I noticed a Dept. of Labor list of critical occupations.

I graduated from the University of Michigan in February, 1949 with a BS Degree in Physics. Since then I have had one year of graduate work in the same course. If there is a shortage of mathematicians as you indicate, where are those shortages? I have written some sixty-odd companies, and all have no positions or jobs open. A little light between us is indicated.

J. A. SWANSON
Marquette, Mich.

The Dept. of Labor list of critical occupations is the basic criteria for deferment of reservists and National Guard members. It indicates that these occupations are essential to the war effort and should be used only to forecast potential, not actual, shortages.—Ed.

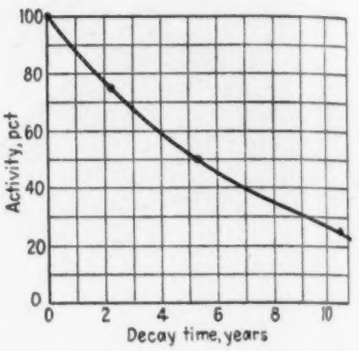
Half Right Half-Life

Sir:

We have read with much interest the article "Cobalt 60 for Low Cost Radiography" in the Aug. 24 issue. We are glad to hear of industrial uses for isotopes, since we in industry are somewhat overshadowed by the extensive use of these new materials in the life sciences.

May we call your attention to the graph on p. 68. It shows the decay of Co 60 to be a linear function of the remaining activity, whereas this should be an exponential relation. The enclosed graph, plotted with the same coordinates that you show, shows the correct shape of the curve.

K. M. LAING
Research Laboratories
Pittsburgh Plate Glass Co.
Creighton, Pa.



Sir:

We note with interest article in the Aug. 24 issue entitled "Cobalt 60 for Low Cost Radiography," by William Czygan, Associate Editor. We would like to draw attention to the fallacious Fig. 1. The misinformation about the character of Cobalt 60 as conveyed by this figure should be corrected in your columns.

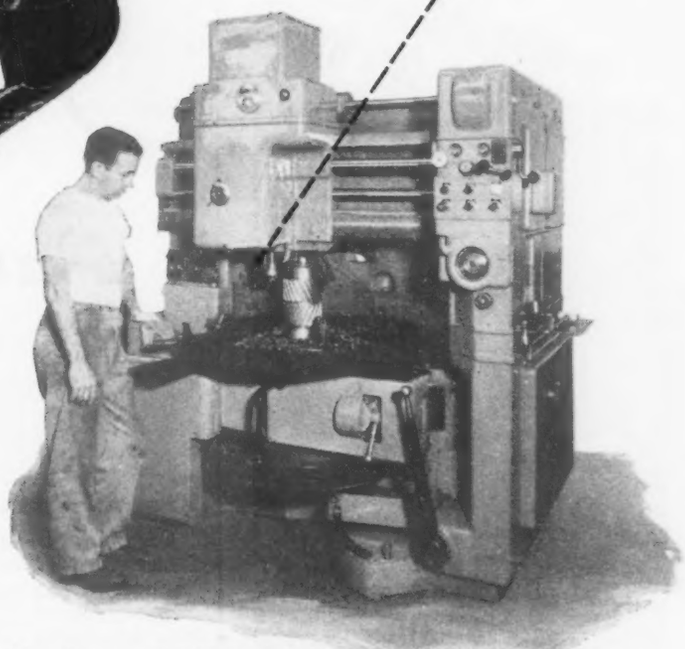
Cobalt 60 is subject to the same exponential decay characteristic of unstable isotopes and your illustration tends to give the uninformed a totally erroneous impression of the character of such materials. Errors of this character in your columns tend to shatter the confidence of your readers in technical discussions prepared by your staff writers.

J. J. KANTER
Directing Engineer
Crane Co.
Chicago

Perhaps your confidence in our work will improve a bit if we explain what happened on the Cobalt 60 diagram. After carefully checking all the type on the article, we realized that a Cobalt 60 decay curve would be a useful addition. Accordingly, we rushed a photostat to the drafting people who do our work, with an order to prepare a clearer chart. Time was of the essence. When we got it back, we realized he had made the exponential curve into a straight line. Trouble was, he was working from a log chart to a fixed interval chart.

But since the half life point was correct and the first five years almost exact, we decided to use it. Our feeling was that the period after the half life was irrelevant for practical purposes. Perhaps we erred. But it was a question of this or nothing—Ed.

SUCH CHIPS



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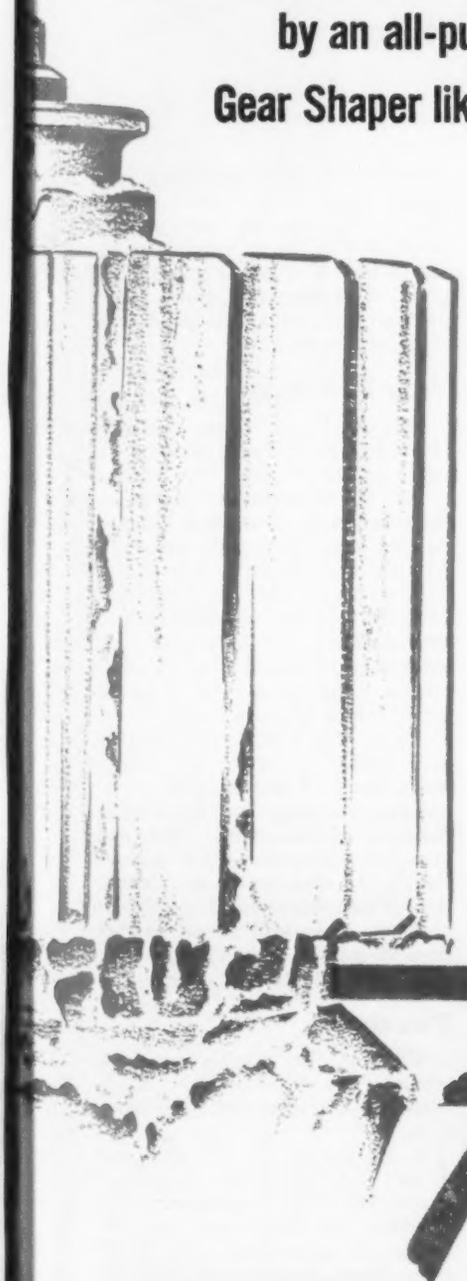
Such Hogging Out of Metal
by an all-purpose
Gear Shaper like this



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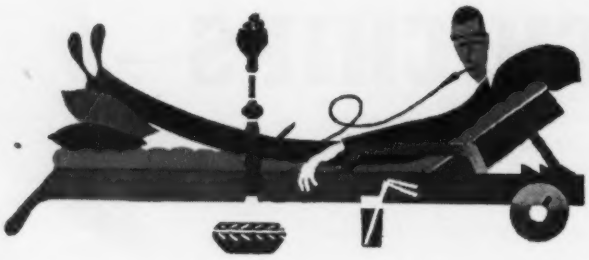


Fatigue Cracks

By CHARLES T. POST

From the Mail

Question: "Don't know why, but I received quite a shock the other day when I ran across an item regarding your associate editor, H. W. Van Camp, that referred to 'her.' Can't remember ever seeing a lady on an open hearth floor. Oh, no, I admire the ladies and know that they can write and edit as good as any man. It's just that I never have associated them with pig iron, scrap or IRON (AGE) editors. Who else is a lady?—Gilbert Lindgren, Troy, N. Y.

Answer: "Helen Van Camp is our only lady editor. To be more specific, she is our only female editor.

"She does not taint the open-hearth floor or the machine shop. Her only job is to edit New Production Equipment. At that she is unsurpassed. What man could cut through the flowery prose of new product announcements, smelling out the new machines as opposed to the repainted 1913 models? Only a woman is suspicious enough and patient enough to handle this sort of thing with diplomacy week after week.

"As long as she doesn't put lace curtains at the windows, we are happy and we think the readers are, too. Need we apologize?" —C.T.P.

Aptronyms: Poultry

Though it seems virtually impossible, the author of an article on chicken raising in the latest issue of *Steelways* is George Laycock.

Then there is the case reported from Cleveland Heights by Taylor Lyman, *Metal Progress* associate editor, of Dog Warden James Drake. Drake ducked out to investigate a complaint that a local family was raising geese in the back yard. As any aptronymist would expect, the expedition turned out to be a wild goose chase. The geese, a mother and three babies grouped around a fish pond were made of plaster.

War Shortage

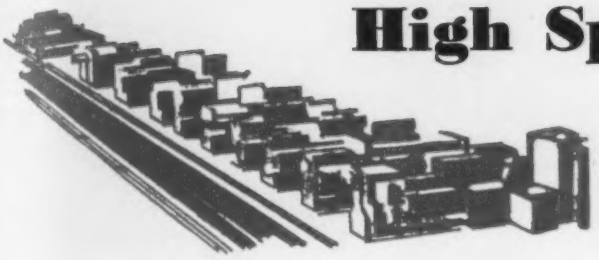
One of the grimmest shortages faced by the government has not yet been publicized. The bureaucrats are grim-faced because of their inability to expand the production of 3-letter combinations for naming war agencies. Try as they will, they can't get the total number of possible combinations to exceed 26^3 or 17,576. Most of these were used in World War II. This means going to 4-letter combinations, which anyone knows aren't as good. The 4-letter combinations add 456,976 possible tags, somewhat short of the 12-digit combinations common in Washington financial combinations. This may give the agency-namers a sense of inferiority, even cramp their spending. From the public's standpoint, at least, there will be no duplication of names even though there is some duplication of effort.

Puzzlers

Bill won last week's speedboat contest; Joe came in last. E. M. Hoover's official worksheet is available.

A. C. Wilcox submits this one: A ball 2-ft in diameter rests in one corner of a rectangular room, touching the floor and the two walls. A larger ball rests in the same corner, touching the floor, the two walls, the ceiling, and the smaller ball. How high is the room?

MACHINE TOOL
High Spots



Sales Inquiries and Production

By W. A. LLOYD

Rises Despite Shortages—Paced by a continuing upsurge in new order volume, production of machine tools was gaining momentum this week despite growing shortages of certain raw materials and components.

Preliminary reports indicate that August order volume will reach an index figure of 300, highest since March, 1943. Shipments are expected to be double the July total, all of which leads some observers to believe that the industry will reach $300 million in shipments this year.

Most are Private Orders—Some August business stems from defense sources, which are expected to provide additional volume in the months to come. Bulk of the business, however, did not originate in defense contracts, according to company spokesmen. Escalator clauses may be a factor in placement of some orders.

Some industry sources point out that when new orders push rapidly to a peak, a period of leveling off usually follows. Present facts do not support this position, however, since the volume of quotations at many plants is greater than available manpower can handle. As somebody has said, a "good market begets a good market."

Effects of Shortages—A number of companies in the industry are feeling the steel shortage. One company was offered first quarter delivery on some tonnage that is needed in the last quarter of this year, and some companies that operate their own foundries are having trouble getting adequate tonnages of merchant iron.

Another pinch is shaping up in forgings, production of which is in turn limited by available steel. Motors and drives are also showing signs of tightening up.

Escalator Clauses Necessary—As a result of these shortages and the price increases on castings and other components, the escalator clauses under which many companies are selling become a practical necessity. Some big customers and the U. S. Government don't like them, but they are the industry's only recourse other than a continual round of price increases. Production costs are going up.

One machine tool company executive put it like this, "With wages and raw materials costs in their present state of instability, how can we sell on a fixed price? Almost everything we buy has an escalator clause on it."

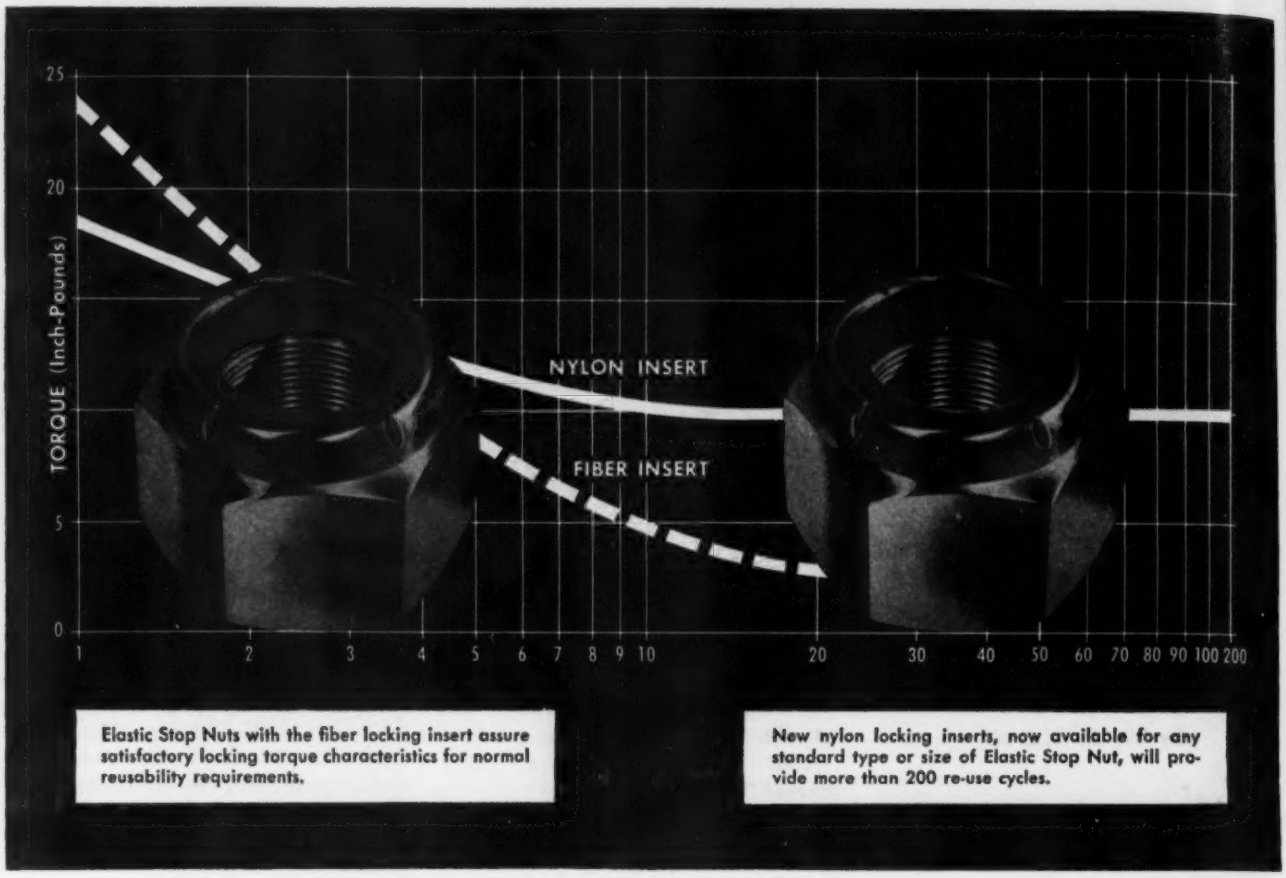
Reserve Tools Inadequate — In Detroit, reports that the new Cadillac tank plant at Cleveland will be tooled largely with emergency production reserve tools appear to be grossly exaggerated. On the contrary, it has been indicated that it will be surprising if 15 pct of the tooling can be accomplished with warehoused machines.

Sources close to the new tank program at Cleveland have indicated that many of the machines listed in the EPR records as standard have been found to be special in many respects. Rather than attempt to rebuild this equipment, it is reported that new machines will have to be ordered. Also, classification of many machines has been reported to be inaccurate or incomplete, necessitating a lot of wasted activity in tooling the plant. There are indications that much of the production equipment will be purchased in Cleveland, although a substantial volume of tool room equipment will probably be placed in the Detroit area.

Set Up Advisory Committee—In Washington, NPA officials have confirmed a report that a machine tool industry advisory committee is being set up. The project is in the plans stage at the present, although the machinery branch has drawn up a tentative list of manufacturers and submitted it to Secretary of Commerce Sawyer, as its recommendation for initial membership.

It is understood that no users or distributors are on the list—only producers. No date has been set for a meeting. The feeling seems to be that the important thing right now is to get these committees set up for machine tool and other industries to advise on possible allocations, priorities, etc.

New Plant Projects—Elsewhere, a number of new plant projects have been reported, including one by General Instrument Corp., Newark, N. J., which plans to establish a Midwest plant. About 22 pct of General Instrument's business is now in the Midwest.



How do you measure Reusability?

UP TO FIFTEEN TIMES?

For assemblies that must be locked in place, Elastic Stop Nuts with fiber locking inserts guarantee a permanently secure grip—plus ample reusability to cover most normal maintenance requirements.

For assemblies that must be disassembled and reassembled five, eight, ten, or more times during normal use, fiber insert Elastic Stop Nuts make the ideal self-locking fastener.

When an Elastic Stop Nut is run on a bolt, the Red Elastic Collar hugs the bolt—actually makes a skin-tight fit against the entire contact length of the threads—and this controlled torque firmly resists vibration or shock. When the Elastic Stop Nut is removed from the bolt, the natural resiliency of the Red Elastic Collar is your guarantee of continuing torque when the nut is reapplied.

MORE THAN FIFTEEN TIMES?

Now, for assemblies that require constant adjustment or frequent disassembly for checking and maintenance, ESNA offers all standard types and sizes of Elastic Stop Nuts with the new nylon locking inserts.

Reusable up to 200 times with remarkably constant torque characteristics, these new Elastic Stop Nuts offer the one-piece construction, the shock resistance, and the moisture-seal features that many manufacturers now depend upon in the standard Elastic Stop Nuts.

One of these Elastic Stop Nuts is probably the solution to your most troublesome fastener problem. It will pay you to look into the self-locking performance of Elastic Stop Nuts. For information, write for a new, free booklet. **Elastic Stop Nut Corporation of America,** 2330 Vauxhall Road, Union, New Jersey.

ESNA
TRADE MARK

ELASTIC STOP NUTS

OVER 450 TYPES AND SIZES IMMEDIATELY AVAILABLE FROM STOCK

FREE — USE POST CARD

PUBLICATIONS

New publications that describe money saving equipment and services are available free and without obligation. Copies can be obtained by filling in the attached card and mailing it.

Silicone Products

Dow Corning silicone products, including fluids, compounds, greases, resins and varnishes, Silastic, and silicon chemicals, are described in a new 4-p. reference guide. The high thermal stability of these materials are discussed, showing that they retain their essential properties over a temperature range of 600°F. Dow Corning makes more than 100 different silicone products and a wide variety of silicon chemicals, some of which are briefly covered in the folder. *Dow Corning Corp.*

For free copy insert No. 1 on postcard.

Hydraulic Cylinders

Illustrations, specifications, design, construction and operation features, and suggestions for uses of Hanna high pressure hydraulic cylinders are presented in a new 28-p. catalog. The booklet shows that there is a complete line of Hanna cylinders for every mounting requirement, for hundreds of applications where a controlled push, pull, lift, press or clamp is desired, and for working pressures up to 1500 psi. *Hanna Engineering Works.*

For free copy insert No. 2 on postcard.

Flow Regulator

A cutaway illustration which clearly explains the operation of the Kates direct acting flow regulator is the principal feature of a new 4-p. bulletin. Specifications are given for regulators from 0.1 to 100 gpm, but larger units are available. The bulletin shows how this completely self-contained unit is entirely independent of air lines, electric current, remote valves or other connected apparatus, and is available for controlling flow of water, acids or oils at high or low temperature and pressure. *W. A. Kates Co.*

For free copy insert No. 3 on postcard.

Industrial Glove Service

Glovco industrial glove service is covered in a new folder detailing a variety of plans to suit any shop's requirements. Services described include cleaning and repairing all types of gloves, cleaning only, glove sales, and complete reconditioning service on all types of protective clothing. Steel containers for shipping are provided for plants outside the local delivery area, and there is no charge for shipment back and forth. The folder points out that it is both practical and economical to salvage and recondition any kind of glove. *U. S. Industrial Glove Corp.*

For free copy insert No. 4 on postcard.

New Tube Forming

Photos and diagrams showing comparisons between the Spun End Process and the old traditional method of tube fabrication are contained in a new 28-p. brochure. This entirely new method, which consists of spinning to a predetermined shape without the application of external heat, is adaptable to all nonferrous metals that can be produced in tubular form. *Wolverine Tube Div., Calumet and Hecla Consolidated Copper Co.*

For free copy insert No. 5 on postcard.

Surface Grinding Manual

The fourth edition of the 83-p. booklet entitled "Work Done on the Blanchard," contains latest information on the surface grinding of all types of metal, glass and ceramic parts. The booklet is profusely illustrated with photographs and line drawings showing correct grinding techniques, chucking methods, holding fixtures, and other details. *Blanchard Machine Co.*

For free copy insert No. 6 on postcard.

Aluminum Scaffolds

A new 4-p. bulletin contains information on aluminum sectional rolling scaffolds. The folder includes photos of scaffolds in actual use, specifications, complete descriptions of the pre-fabricated construction and uses. Features described are lightness, ease of erection, neatness, durability and adaptability to many services, as well as easy dismantling and storing, and availability of individual parts. *Patent Scaffolding Co., Inc.*

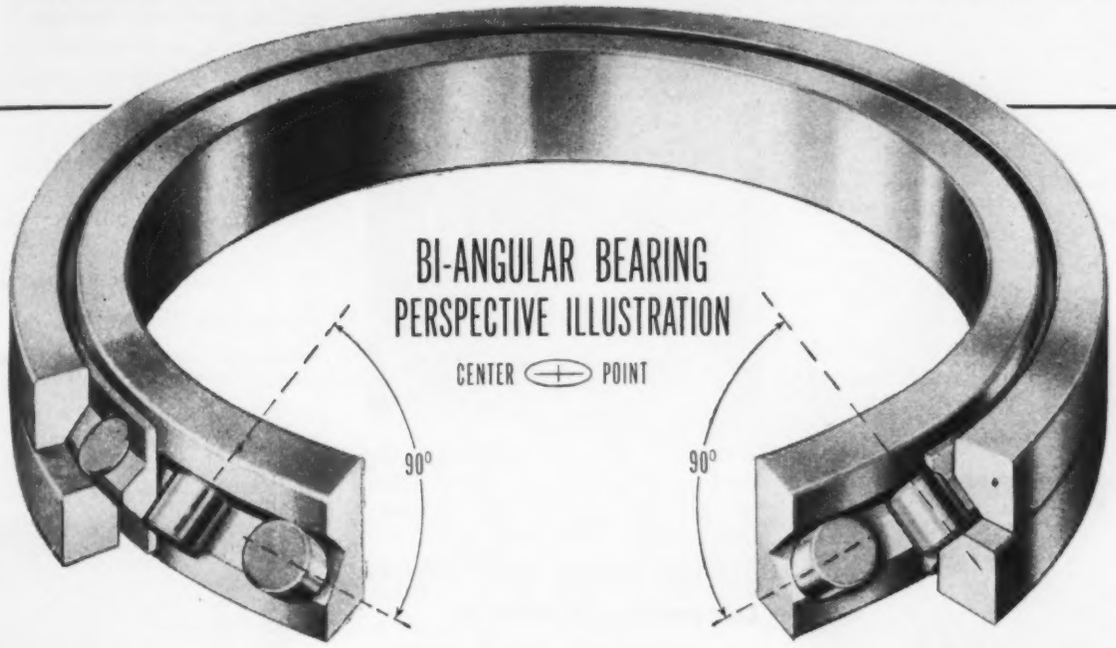
For free copy insert No. 7 on postcard.

Effective Sales Training

How to plan and conduct an effective sales training meeting is the subject discussed in a compact and informative 84-p. booklet. The five chapters hardly omit a detail, from the moment the decision is made to hold a meeting until the

Turn to Page 126

KAYDON BI-ANGULAR ROLLER BEARINGS



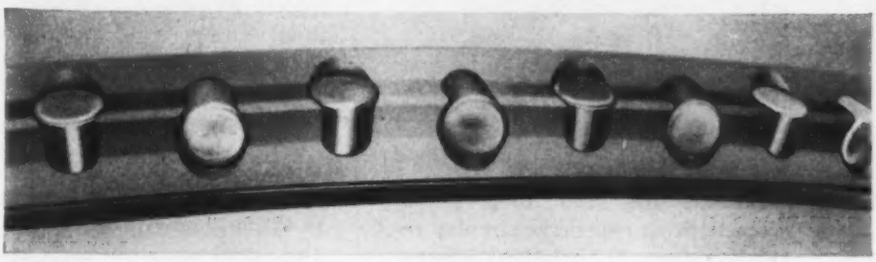
Does your bearing problem involve *both* thrust *and* radial loads? KAYDON BI-ANGULAR Roller Bearings are adaptable to various proportions of thrust and radial loads, as indicated below. These bearings are particularly suitable for low speed applications involving impact loads.

Whatever *your* bearing needs may be, KAYDON has *all* the facilities your engineers require. Whether you need only a few or many special bearings 4" to 120" outside diameter, or millions of high precision rollers, contact KAYDON for confidential counsel and cooperation.

ADAPTABLE TO EQUAL OR UNEQUAL THRUST AND RADIAL LOADS

For thrust loads *equal* from both directions, KAYDON BI-ANGULARS are made with every other roller reversed, as shown here. Adjacent rollers are at 90° angles to each other, permitting this bearing to take either radial loads or thrust loads, or a combination of both.

To handle heavy thrust load *greater* from one than the other direction, the bearing can be made with every second, third or fourth roller reversed, depending upon how relatively *unequal* the loads may be. Write for further detailed information.



31.000" x 34.988" x 2.000" KAYDON BI-ANGULAR Roller Bearings have been produced in large quantities and are successfully in use. They are further proof of KAYDON ability to design and make unusually large, precision bearings for specific needs.

KAYDON Types of Standard or Special Bearings: Spherical Roller • Taper Roller Ball Radial • Ball Thrust • Roller Radial • Roller Thrust • BI-ANGULAR Roller

THE KAYDON ENGINEERING CORP., MUSKEGON, MICH.

• ALL TYPES OF BALL AND ROLLER BEARINGS 4" BORE TO 120" OUTSIDE DIAMETER •

NEW

PRODUCTION IDEAS

Continued

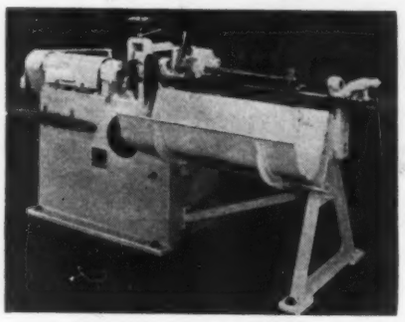
easily made. A wide range of bore diameters is obtainable with each size boring tool. *Davis Boring Tool Div., Giddings & Lewis Machine Tool Co.*

For more data insert No. 20 on postcard, p. 35.

Wire Straightener

Operates on rotary principle; handles 3/32 to 9/32 in. diam wire.

A new wire straightening machine, the TKM-6, is entirely automatic taking wire from a reel into rotating straightening dies. These dies subject the wire to repeated rotary bending which removes internal stresses. The wire is fed by a pair of transport rollers onto a



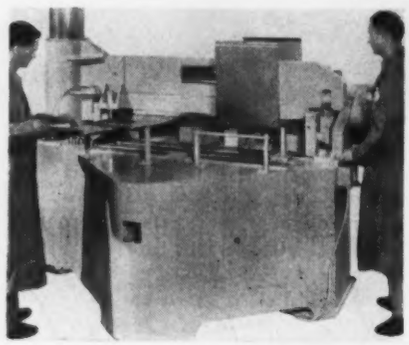
guide bar where it makes contact with a stop that actuates the cutting mechanism. The rate of feed varies from 56 to 181 fpm. The machine will straighten and cut wire to any desired length up to 19½ ft. *American Pullmax Co.*

For more data insert No. 21 on postcard, p. 35.

Tangent Bender

Open-throat, single-wing machine forms metal cabinets in one piece.

An open-throat, single wing, tangent bender completely forms a variety of cabinets in one piece, in a single cycle of operation. It can produce cabinets with either flat or crowned sides, and because die changes are simple and inexpensive, it is readily adapted to making bends of different radii to form the various types. A unique latching arrangement simplifies unloading of the finished cabinet. In action, the ram of the new machine descends rapidly to within 1 in. of the bottom of its full stroke. Latches at both ends of the ram engage levered arms on the bed and pull the ram down with a pressure of 17 tons. Flat metal sheets can be blanked, punched or otherwise formed during this initial move-



ment, and then held steady for the bending wing to move up and form the corner radius, with wrinkle-free flanges. *Cyril Bath Co.*

For more data insert No. 22 on postcard, p. 35.

Laboratory Cameras

A revolving body feature permits 360° rotation of the camera backs.

A new series of Spencer 35 mm and 4x5 in. photomicrographic cameras has been announced. A revolving body feature that permits 360° rotation of the camera backs

eliminates the need for a microscope with an expensive circular revolving stage. A light-tight adapter permits the photographer to swing the camera over or away from the microscope without raising or lowering the camera body or disturbing the focus of the microscope. Critically sharp focusing is obtainable with a telescopic focusing eyepiece equipped with cross-hair reticule. *American Optical Co.*

For more data insert No. 23 on postcard, p. 35.

Air Vibrators

For intermittent or continuous operation on bins, hoppers, chutes.

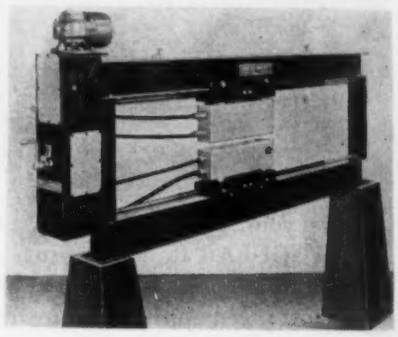
Series 81 pneumatic vibrators deliver powerful, hammer-like impacts in a direction 90° to material flow, preventing arching-over or plugging and assuring positive flow of materials. A corrosion proof, bronze alloy cylinder liner assures full-power start, high-speed operation, and maximum service life. *Spo, Inc.*

For more data insert No. 24 on postcard, p. 35.

Beta Ray Gage

Traverse mounting permits edge-to-edge scanning of continuous strip.

A traverse mounting is available for the Pratt & Whitney beta ray



continuous mill gage making it possible to scan and gage the full width of continuous strip material. The rate of scanning is from 18 to 30 ipm and the operation is completely automatic. Limit stops are set on the rail of the traverse mounting so that when the beta ray gaging heads reach the edge of the strip material they automatically reverse and scan in the opposite direction. This permits a complete cross-sectional and longitudinal analysis of the material being processed. *Pratt & Whitney, Div. Niles-Bement-Pond Co.*

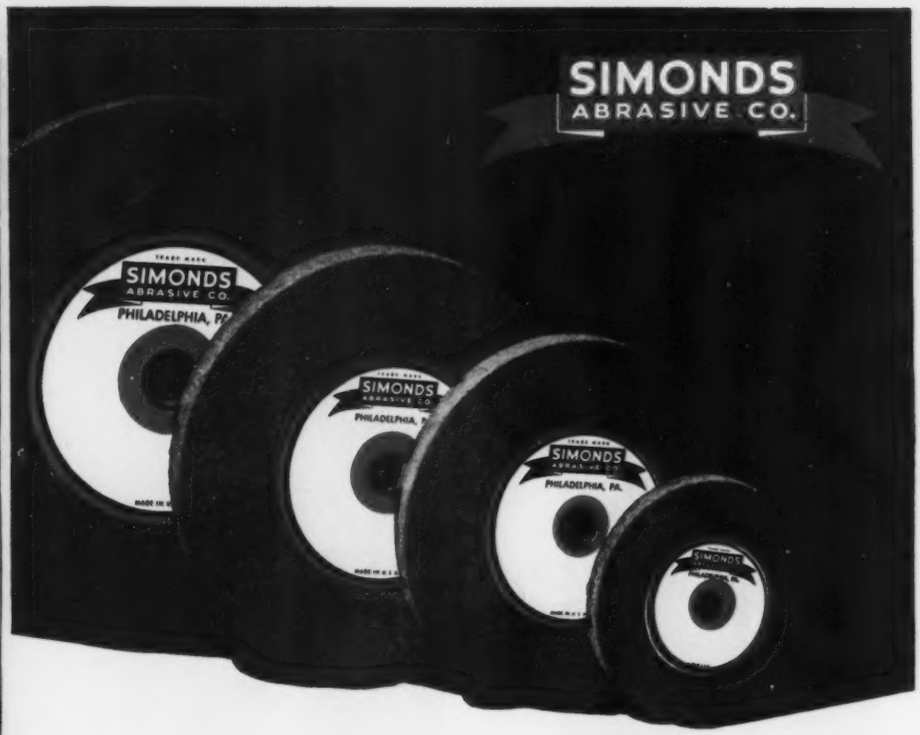
For more data insert No. 25 on postcard, p. 35.

Adjustable Conveyer

Features adjustment from horizontal to 45° in 30-in. vertical range.

Developed to handle small stampings, castings, borings, turnings, chips and granular materials, the Little Hustler is suitable for use with permanent conveyer systems as an auxiliary unit to feed or dis-

Turn to Page 128



For low-cost efficiency on all your grinding jobs

You get productive efficiency with Simonds Abrasive Snagging Wheels on your swing frame, floor stand and portable grinders. They stand up to the severest strain of rough snagging . . . giving action that bites into the toughest metal . . . and economy that shows up in top tonnage ground.

Resinoid bonded for speeds up to 9500 s.f.p.m. . . . Vitrified bonded for speeds up to 6500 s.f.p.m. Available in specifications for cleaning castings and billets and for use on a variety of metals and non-metals.

Write for Bulletin ESA 62 for full information and the name of the Simonds Abrasive distributor equipped to serve you locally.

SIMONDS ABRASIVE COMPANY, PHILADELPHIA 37, PA., DISTRIBUTORS IN PRINCIPAL CITIES

DIVISION OF SIMONDS SAW AND STEEL CO., FITCHBURG, MASS. OTHER SIMONDS COMPANIES: SIMONDS STEEL MILLS, LOCKPORT, N.Y., SIMONDS CANADA SAW CO., LTD., MONTREAL, QUE. AND SIMONDS CANADA ABRASIVE CO., LTD., ARVIDA, QUE

Iron Age *Introduces*

DONOVAN L. SAYRS, who becomes manager of contract sales division, Globe-Wernicke Co., Cincinnati.

CHARLES A. TAYLOR, elected treasurer, Copperweld Steel Co.

K. L. KONNERTH, elected vice-president and general manager of operations, H. C. Frick Coke Co. and U. S. Coal & Coke Co.

HORIZONS INC., Princeton, N. J., has added **Melvin D. Fleisher** to its Cleveland laboratory staff.

W. A. Steele, general manager at the Benwood Works of WHEELING STEEL CORP., has been appointed general manager at the company's Steubenville Works, succeeding **R. C. Diehl**, acting general manager, resigned. **Paul W. Koenemund** was moved up from assistant general manager at Benwood Works to succeed Mr. Steele. **E. Tyler Davis**, assistant to the vice-president in charge of operations, will take over ore matters recently handled by Mr. Steele.

S. R. Marshall was appointed director of purchases for HYDRAULIC EQUIPMENT CO., Cleveland. He was formerly associated with JOY MFG. CO. as purchasing agent and with the Plymouth Div. of CHRYSLER CORP.

R. Chris Nitschke has joined ROCKWELL MFG. CO., Pittsburgh, as a project engineer on the company's petroleum products.

Allen M. Adams joined BELL & HOWELL CO., Chicago, as director of purchases. Since 1946 Mr. Adams has been in charge of purchasing at CROSLEY MOTORS INC., Cincinnati.

W. D. Millar and **H. E. Kaufman** were appointed division superintendent and assistant division superintendent of blast furnaces, respectively, for the South Chicago plant of CARNEGIE-ILLINOIS STEEL CORP. Mr. Millar succeeds **J. M. Stapleton**, recently promoted to assistant vice-president.

David Meeker, director of education for DEARBORN MOTORS, Detroit, was named Pacific Coast sales manager. The promotion fills a vacancy caused by the death of **A. F. McGraw**.

Cyrus Eaton was reelected chairman of the board and **M. S. Fotheringham** was elected president of STEEP ROCK IRON MINES, LTD., Steel Rock Lake, Ontario.

Herbert J. Rieth has been appointed assistant purchasing agent of PURCOLATOR PRODUCTS, INC., Rahway, N. J.

W. Dolph Hornbruch was named New York City representative for the AMERICAN GAS FURNACE CO., Elizabeth, N. J. He was formerly assistant sales manager of the company. **Earle S. Dudley**, former New York representative, is no longer associated with the company.

George O. Nations received the appointment as assistant to the general manager of sales of NATIONAL TUBE CO. **Albert J. Graf, Jr.**, was promoted to succeed Mr. Nations as the company's manager of claims.

Joseph F. Timmerman, Jr., was elected vice-president in charge of sales for JOHNSON STEEL & WIRE CO., INC., Worcester. Robert F. Lauterbach resigned as treasurer to accept a post as assistant to the treasurer and secretary of PITTSBURGH STEEL CO., a Johnson Steel & Wire Co. subsidiary. **Gerald R. McClure** was elected treasurer to succeed him and **James S. Howard** was named assistant treasurer, succeeding Mr. McClure.

O. W. Klima has been made chief engineer of ABART GEAR & MACHINE CO., Chicago.

V. P. Preidis has been appointed sales representative for the DENISON ENGINEERING CO. in the New England area. **Frank Krause** was made representative for northern New Jersey and the New York counties of Dutchess, Orange, Putnam, Rockland, Sullivan and Ulster. He replaces **Pearce Edwards**, who recently resigned.

J. G. **Graham** was made eastern regional manager of locomotive sales for the railroad division of FAIRBANKS, MORSE & CO. **D. C. Prescott** is the new district manager—locomotive sales of the southwestern district and will be located in St. Louis. C. H. **Morse, Jr.,** was appointed district manager — locomotive sales in Chicago.

Richard W. Webster has joined JOHN W. MASURY & SON, INC., Baltimore, as a consultant. The announcement was made by Masury's new president, **Frank P. Connolly,** who was formerly vice-president and general sales manager for VALENTINE & CO., New York City.

R. **Peacock** has been named sales manager of GENERAL REDUCTION CO., a subsidiary of THE DIVERSEY CORP., Chicago.

Graham W. Corddry was elected vice-president in charge of sales of Titanium Pigment Corp., a NATIONAL LEAD CO. subsidiary. **K. W. Ericson,** formerly western sales manager, was named general sales manager, succeeding Mr. Corddry. **John A. Lutz** was appointed eastern sales manager, succeeding **W. H. Woods.** Mr. Woods succeeds Mr. Ericson as western sales manager. **Earl W. Diener,** formerly in charge of New England territory, was named a district sales manager. **W. F. Malcolm** will take over Mr. Diener's previous post. **Norman E. Olson** has been appointed a district sales manager in the Chicago area and **Fred R. Hodgson,** district sales manager in the Cleveland area. **James MacGuffie** has been named manager for the technical service department.

FLOYD E. SHAFFER, M. D., appointed medical director of Bethlehem Steel Co.

Iron Age Salutes

JOHN N. MARSHALL

SOME people would call John N. Marshall a man of vision. We like to think of him simply as a man who enjoys seeing.

Here is the way you will meet him for the first time. Before you go through the door to his office at Granite City, Ill., he might be any of hundreds of personalities you have come across before. Part of the way he is when you walk through the door is the way you are. What you won't expect to find is a really relaxed, swell guy. But he is.

You'll also be surprised to find he likes to see you. And the next guy, too. Not because he's sentimental about people. He isn't. Nor is it because you're a customer, or an old friend, or have some tin to sell him. It isn't sentiment or the sight of a quick buck that makes John Marshall greet you happily with an offhand wave of his hand and a quick gesture to sit down. He just likes to see.

Though he's friendly and kindly, the chairman of Granite City Steel Co. isn't giving away steel. When occasion demands, this slim, middle aged gentleman can be as hard as the metal he makes. His background is steel.

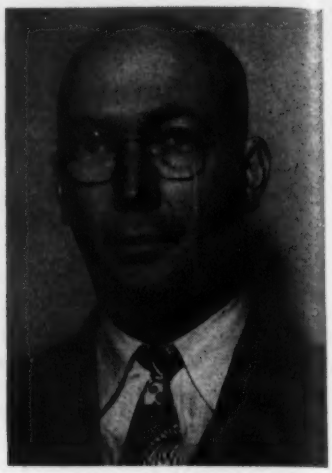
He was born in Pittsburgh in 1897, graduated from Lehigh University in 1920. After Bethlehem Steel Co. acquired the McClintic-Marshall Corp. in 1931, he worked for Bethlehem as an engineer. He had been a director of Granite City for 15 years prior to becoming chairman of the company last year.

When two other steel companies tried to buy Granite City a few months back, they didn't get it. They had a nice visit, he let them see the plant; but they didn't take it away with them.

John Marshall is going to build an empire on the Mississippi, an important steel empire. He has taken over a well built little kingdom and it is going to be an empire. Why? Because Mr. Marshall is a man who sees. Empires are built by men who see possibilities. The possibilities have to rise and along the Mississippi they have risen. That's why the other companies wanted to buy Granite City. The important thing in any country, in any industry, or in any company is whether the leaders see.

RICHARD MEISENBACH, named director of newly created special products division, J. B. Beaird Co., Inc., Shreveport, La.

HARRY G. McMURRY, appointed manager, Dearborn Iron Foundry, Ford Motor Co.



E. CLAUDE JETER, made manager, Ford Motor Co.'s new production foundry under construction at Cleveland.

The honorary degree of Doctor of Humanities was awarded recently to **Charles R. Hook**, chairman of the board of directors of ARMCO STEEL CORP., by Muskingum College.

Fred K. Knohl, formerly in charge of field engineering, has been appointed chief engineer for SHAKEPROOF INC., Chicago. **Kenneth C. MacKay**, associated with Shakeproof since 1939 and recently sales analyst and director of the sales training program, has been named budgetary control manager. **Elbert Faust**, formerly production superintendent, has been named assistant works manager. **Henry Archer**, general foreman, has been named to succeed Mr. Faust as production superintendent.

Henry M. Sossaman was made general sales manager of Quaker Rubber Corp., a division of H. K. PORTER CO., INC., Philadelphia.

Walter V. Ronner was named to fill the post of director of industrial relations for LEWYT CORP., Brooklyn.

Stanley B. White, who has been plant manager of the Trentwood, Wash., rolling mills of the KAISER ALUMINUM & CHEMICAL CORP., has been named manager of all of that company's fabricating plant operations, and **Norman Krey**, who has been plant manager at the Mead, Wash., reduction plant, has been elected to the position of manager of all reduction plant operations. The Mead reduction plant will now be under the supervision of **J. H. Lindemuth** who had formerly been superintendent of the works and the Trentwood rolling mill will be headed by **Arthur Branstead.**

Elmer W. Krueger, operations manager at the CLEVELAND PNEUMATIC TOOL CO., was elected to the board of directors of the company.

Henry A. Rome was appointed manager of special products sales, **William C. Hall,** manager of molded goods sales, and **Thomas S. Savoury,** manager of flooring sales for the mechanical goods division, U. S. RUBBER CO.

Myran J. Livingston has been appointed to the post of sales manager of the petroleum refining division, ARTHUR G. McKEE & CO., Cleveland. He will headquarter at the company's main offices in Cleveland. For the past 6 years Mr. Livingston has been in charge of the company's sales office in New York.

Appointments in the Schenectady large motor and generator engineering division of GENERAL ELECTRIC apparatus department have been announced. **Bascom H. Caldwell, Jr.,** has been named assistant manager of engineering, and **D. E. Brainard, Howard D. Snively, Robert V. Shepherd,** and **Robert W. Wieseman,** division engineers.

Arthur C. Moore becomes division vice-president of the Intermountain sales division for COLUMBIA STEEL CO. and will maintain offices in Salt Lake City. He has been with Columbia since 1910 having started with foundry operations in Portland in 1914. In 1923 he was appointed district sales representative in the Intermountain area.

Victor W. Johnson has been placed in charge of COLORADO FUEL & IRON CO.'S rod mill at Pueblo.

Victor Fedosky has been appointed assistant manager of the Ambridge, Pa., plant of U. S. STEEL CORP.'S American Bridge Co. He has been assistant to plant manager at the company's Gary, Ind., plant. Mr. Fedosky has been with U. S. Steel since 1913 when he started at the American Bridge Co.'s Gary plant as a rivet heater. Later he was employed as a craneman, draftsman, clerk, templatemaker and inspector, and in 1920 was made inspector-foreman at Gary.

OBITUARIES

George R. Gibbons, pioneer in the development of the aluminum industry and a director of Aluminum Co. of America, died on Sept. 3.

W. F. Detwiler, 72, former chairman of Allegheny Ludlum Steel Corp., passed away on Sept. 5. Mr. Detwiler held the title of honorary board chairman since his retirement last year.

William J. Davidson, director of General Motors new Technical Center, died on Sept. 7.

Dr. Loyal A. Shoudy, medical director of Bethlehem Steel Co., died Aug. 30 at Bethlehem, Pa.

Abraham Berger, 85, a retired scrap iron and metal dealer, passed away recently at Brockton, Mass. He established A. Berger & Sons, Inc., more than 50 years ago.

John A. Flynn, who had been associated with the automotive industry since its early development, died recently in Detroit. He was 70.

Dr. John C. Southard, director of research at Solar Aircraft Co., San Diego, died Sept. 4 at the age of 43.

On the ASSEMBLY LINE

AUTOMOTIVE NEWS AND OPINIONS

Nash introduces '51 models . . . Engine tooling programs lag . . . Big auto plans for 1952 may be sacrificed . . . K-F purchases new stamping plant near Wheeling.

By WALTER G. PATTON

Model Change—Nash is the second independent auto producer to announce 1951 models. The Nash announcement follows an earlier Packard introduction (THE IRON AGE, Aug. 31, 1951, p. 42). Following the trend of most car producers, Nash has made only limited changes in its 1951 Ambassador and Statesman sedans and coupes. No announcement is being made at this time on the new Nash Rambler sedans.

Most prominent styling change is the elongation of the rear fender to form a streamlined vertical fin. (Curiously enough the Cadillac "fin" which was initially criticized on a broad scale now appears to be the accepted rear fender styling. Kaiser-Frazer, Pontiac, and others have found the rear fender a convenient location for tail-lamps, direction signals, etc.)

Mechanical changes include (1) water-proofed system for ignition plugs and distributor and moisture resistant wiring, (2) 10 pct reduction in steering effort, (3) new starter for Statesman models, (4) new type carburetor, (5) "two-stage valve" shock absorbers which perform equally well in hot or cold weather, (6) new fuel pump for cars equipped with Hydra-Matic and overdrive, (7) new type rubber engine mounts.

New Nash Details — Rocker arms have been redesigned. Hydra-Matic transmission, formerly offered only on the Ambassador, is now optional on the Statesman. Headlamps are protected by new diecast chrome-plated rings. Guards on wrap-around bumpers, front and rear, are heavier section. A chrome protective strip runs horizontally around the car at the base of the fenders.

There has been extensive reworking of the instrument panel. Instruments are regrouped and a visor over the speedometer prevents light reflections. A sliding pull-out drawer is employed. Nash Ambassador has a 115 hp, 6-cylinder overhead valve engine with compression ratio 7.3 to 1. New type U-Flex oil metering piston rings are used in this engine which has a seven-bearing crankshaft. Nash bodies are being completely bonderized both inside and out to protect against rust.

Extend Tooling Programs — It will not be surprising if major producers' tooling programs for high compression engines are extended somewhat beyond present expectations. Some factors affecting the new tooling programs are (1) a growing volume of tooling for defense, (2) loss of overtime in tool and die shops because of the present strike, (3) scarcity of raw materials, (4) development of unanticipated kinks in the new tooling setups.

Not so long ago most automotive tooling was comparatively simple. Programs could be scheduled in advance and kept at the desired pace. Today, with tools much more complex and with the unknown defense factor very much in the picture, master mechanics say the best they can do is make broad, flexible plans and then hope they will come close to completing the job on time.

Korea vs. New Models—Before Korea, most major car producers had planned for extensive 1952 model changes. They are still going ahead with their planning. Tool shops are loaded with work. However, there is a growing awareness of the encroachments of rearmament. Coupled with an acute manpower situation, repercussions from the fifth wage round and the growing scarcity of raw materials, it is quite likely that several of the present plans will have to be shelved.

Political and war developments will eventually tell the story as to whether car producers will be permitted to introduce their 1952 models as planned. The present plans

include major body and frame changes and complete new lines of high compression engines, including both sixes and eights. Improved torque-converter transmission plans are well advanced. There is indeed nothing certain these days about the motor car industry or what will happen to its very high production schedules.

Effects of Wage Hike—The fifth round of wages is bound to create many maladjustments. Detroit tool and die shops, for example, are presently loaded with work, Most contracts now in process will have to be completed at contract prices despite a promised pay boost of 10¢ or 15¢ an hr for unskilled and skilled workers. Since most tool and die makers are skilled, the average increase will be close to 15¢ per hr, bringing the total increase in wages during the past 4 months to 25¢ an hr. This is about a 9 pct gain.

Notes on Chrysler—Latest reports indicate that Chrysler is beginning to set up a production line for its new V-8 high compression engines at the Jefferson Avenue plant. These engines are expected to have newly designed rocker arms and valve gear. Design of the compression chamber is said to be unique. Meanwhile, Chrysler Corp. body tooling for its new models is well advanced although some important work is still not completed.

The Chrysler body changes are expected to be more substantial than that of any other major producer. Appearance of each of the Chrysler line of cars is to be considerably changed. Hard-top models will undoubtedly be available in each Chrysler line of cars.

Kaiser Plans Press Plant—Another move from Detroit into the backyard of a steel company was revealed last week with the announcement that Kaiser-Frazer had acquired a 65-acre tract at Shadyside, Ohio, as the site of a new $3 million press plant. Shadyside is located on the Ohio River south of Wheeling, W. Va.

Seabright Construction Co. of Wheeling, will start on the new 50,000 sq ft press plant immediately. It is expected that within 6 months the plant will be turning out stampings for K-F. This is planned as a supplemental operation to Willow Run. Initial capacity is 3600 tons per day. Press plant equipment is expected to cost $900,000. K-F production hit 1175 last week.

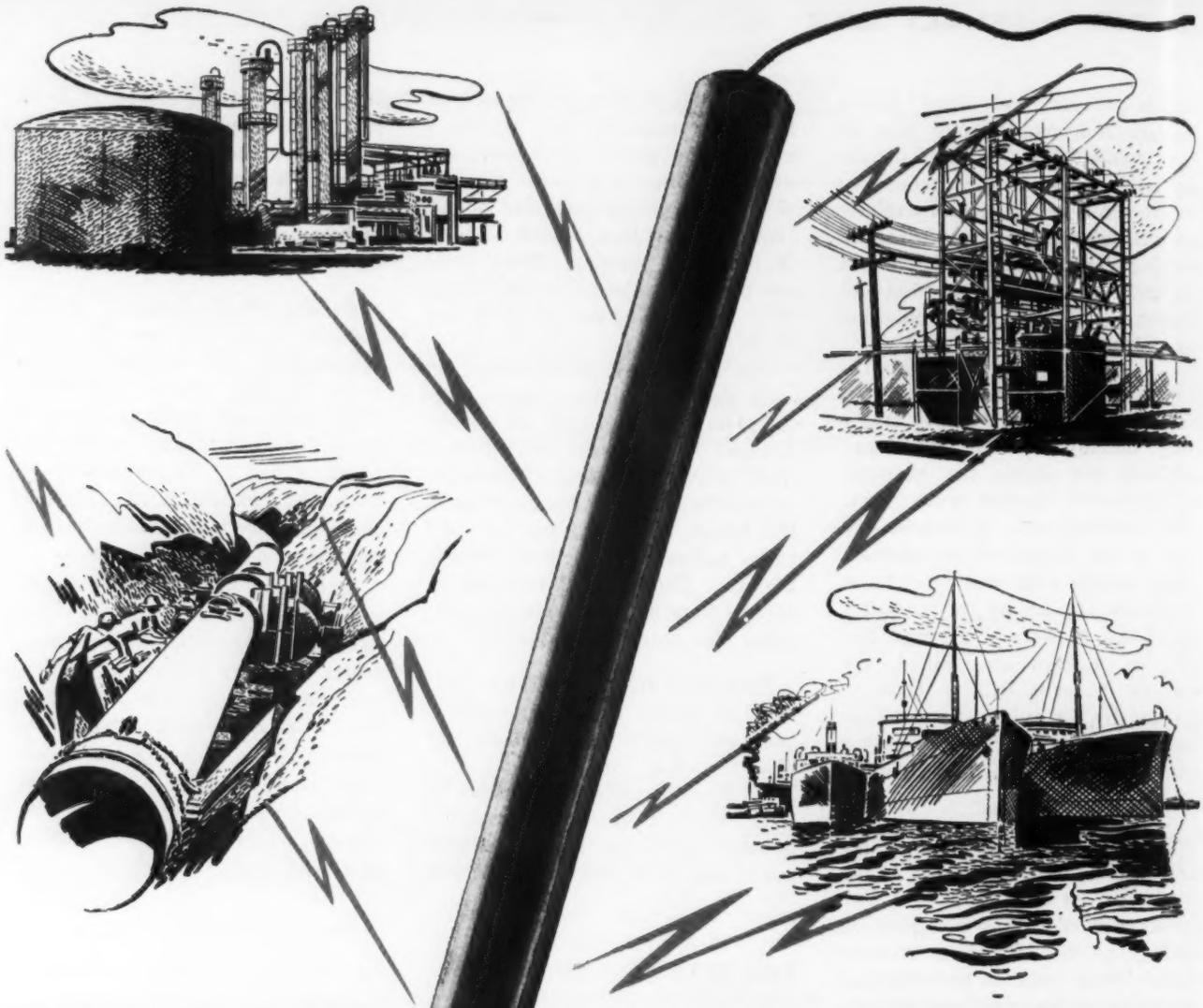
The latest K-F move makes six auto stamping plants located close to steel mills; Budd at Gary; Briggs at Youngstown; Fisher Body at Ambridge and Pittsburgh; Kelsey-Hayes at McKeesport; and, the latest, K-F at Wheeling. All these moves have occurred within 2 years. The biggest contributing factors here are increasing freight rates plus scarcity of steel.

New Cars Held Up—With steel in short supply and tooling uncertain, new model introductions are already being pushed back. The Nash Rambler sedan is an example. Originally slated for introduction at this time, the latest Rambler model has been delayed to the end of the year. Lack of steel plus inability to complete its new Kenosha plant on schedule have caused the delay. Similarly, introduction of the new Henry J. by Kaiser-Frazer is being delayed. One of the principal factors is manpower.

DeSoto Plant Opens — DeSoto officially opened its new body and engine building facilities at the huge Warren Avenue plant last week. The new facilities comprise 1,100,000 sq ft of floor space. The building had to be completely rebuilt. Approximately two-thirds of the floor space is devoted to the production of bodies.

Latest materials handling devices including eight miles of conveyers move precisely under electronic controls. The very latest type welding equipment has been installed. There are 540 separate welding machines. One machine alone produces 198 welds in 17 seconds. The paint department in the new plant is completely isolated from the welding and trim lines.

THE BULL OF THE WOODS — By J. R. Williams



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WEST COAST PROGRESS REPORT

Digest of Far West Industrial Activity—By R. T. REINHARDT

War Impact Light—So far as California manufacturers are concerned, the impact of the $15 billion a year military program has had, and is expected to have for the next 3 months, only a slight effect on the state economy.

A survey conducted among 300 corporations, members of the California Manufacturers Assn., revealed the following: fourth quarter bills of these manufacturers will reflect work done for the government by only 8 pct; only 10 pct of the companies have received direct orders from the government as a result of the Korean campaign; only 19 pct expect any appreciable amount of government orders in the next 3 months; 82 pct say they have not experienced difficulty in maintaining an adequate labor force.

Based on Korean campaign needs, 65 pct did not believe imposition of large scale economic controls were needed, whereas 35 pct said they thought such controls might be necessary; and 78 pct of the manufacturers said they could meet demands of the Korean situation by converting only a minor portion of their productive capacity.

There Are Exceptions — Industries such as the air-frame manufacturers, which have increased labor forces from approximately 83,000 in July 1949 to 86,500 today, and manufacturers of metal products which have increased payrolls from 45,500 in July of last year to 55,500 now, have felt the war's impact both in the way of direct government orders and sub-contracts.

While direct government contracts will probably continue to be relatively few in number on the West Coast, the effects of sub-contracts will undoubtedly be increasingly felt. Aircraft manufacturers such as Boeing Airplane Co. in Seattle and those in the Los Angeles area are already letting considerable numbers of contracts. Indicative of this trend is the increased business southern California foundries have received from oil tool companies.

A sudden revival in drilling and other phases of the oil industry have brought major increases for steel foundries. Overall business for 1950 is expected to equal the banner year of 1948.

Still More Steel?—Steel users in southern California are optimistically expecting the Federal government will be inclined to aid in enlarging facilities of the Kaiser Steel Corp. plant at Fontana as a result of recent conferences in Washington.

Two months ago the company outlined to the government a plan to increase its capacity by 700,000 tons annually with an investment of $100 million which, observers believe, the government may offer to loan the corporation. However, insiders believe Kaiser would prefer to handle future financing through private capital.

At least one of the major insurance companies has publicly stated it might buy up to $10 million of an issue of Kaiser Steel Corp. stock. Last week in San Francisco, Roger Hull, vice-president, and Oliver M. Whipple, financial vice-president of Mutual Life Insurance Co. of New York, reported that company is considering a substantial investment in mortgage bonds.

Holding the Line — Despite a continuing heavy drain on the scrap supplies of the Coast, prices have been holding firm.

Where the scrap is coming from to supply furnaces operating at well over 100 pct of capacity is a mystery. Buyers say abundant scrap is available and dealers tell the opposite story. It is true some dealers have temporarily large inventories, but brokers covering the entire Coast assert these are isolated instances. Some ship-breaking in Portland and at Los Angeles has added to the supply.

Nonferrous Mines Revive—Defense demands for lead and zinc, and consequent price increases, are reactivating Utah nonferrous metal mines which have been down for many months. Utah's most depressed spot, the Park City mining district, has come back to life and the three major companies have reopened or are preparing to reopen. Latest to sign a contract with the United Steelworkers of America, bargaining agent for the mines, was Silver King Coalition, which has been closed for 15 months. New Park and Park Utah Consolidated have been back in operation for several weeks.

THE FEDERAL VIEW

THIS WEEK IN WASHINGTON

By EUGENE J. HARDY

Control Funds Small—President Truman's hesitancy in shifting the government's new business-control program out of low gear prior to the November elections was emphasized again this week in his relatively modest bid for funds—$60 million—to administer the control program.

Granted, $60 million is not hay. It's a large hunk of cash, and it's supposed to keep the control machinery running until July 1 in all the government departments and agencies charged with carrying out the recently enacted program.

World War II Spending—Take a look at these figures: During World War II, the Office of Price Administration alone chewed up annually amounts ranging from $133 million to $186 million; the Office of Emergency Management ran through nearly $1.5 billion in 1943, and the following year ate up another $2.7 billion. Smaller war-time agencies, like the Petroleum Administration for War, averaged about $5 million in annual spending.

So a total of $60 million, to be used in administering all controls, is a comparatively paltry sum. This is not to say that Mr. Truman does not contemplate asking Congress for additional sums between now and June 30, but at the present time it is painfully obvious that a $60 million "control kitty" fits into the "siesta psychology" of the Administration that is receiving much criticism on Capitol Hill.

Price Control Tip Off—Perhaps, even more significant than the $60 million total, is the breakdown. A whopping two-thirds or $40 million dollars will go to the Economic Stabilization Agency for price, rationing, and wage control planning. Only $12 million will be used to administer the priorities, allocations and credit provisions of the new law. The remaining $8 million would be for leasing of office space.

This seemingly disproportionate amount for price, rationing and wage controls lends strength to reports that while the Administration is soft-pedaling these controls now the tune will be different after Congressional elections.

ESA will use the $40 million to develop as broad a system of price, rationing and wage controls as appears necessary. By next Apr. 30 it would permit the agency to have an organization ready to go ahead with a program of selective price controls, plus all necessary planning for blanket controls.

More Ships—Fifteen U. S. shipyards are set to participate in the Navy's new $40 million shipbuilding program as soon as Congress gives the nod.

Among the ships currently under construction and scheduled for completion as soon as the Navy gets the necessary funds are the carrier Oriskany, a task fleet command ship and a "secret" vessel that both Navy representatives and congressmen decline to discuss publicly.

Other vessels included in the program are a submarine, a destroyer, and four motor torpedo boats. Almost all of the ships have been under construction for months, and funds are now sought to get them to the Pacific forces as quickly as possible.

Private contractors scheduled to participate in the program are Bath Iron Works, Bethlehem Steel, Electric Boat Co., New York Shipbuilding Corp., Newport News Shipbuilding & Drydock Corp. and John Trumpy & Sons, Inc. Government yards involved in the deal are located at Portsmouth, Boston, New York, Philadelphia, Norfolk, Charleston, Puget Sound, Mare Island, and San Francisco.

Nickel and Magnesium—It will be at least a year until sizeable production of nickel oxide will be under way at the Nicaro, Cuba, nickel plant. Re-opening of this plant, exclusively reported in THE IRON AGE (Sept. 7, 1950, p. 124), will provide nickel oxide for the strategic stockpile and for defense plants thereby relieving the strain on nickel supplies for civilian use. Officials from the Munitions Board and the General Services Administration are now trying to find a private operator to run the plant for the government. They hope to turn out nickel oxide at a cost of about 5¢ a lb more than the current world market price of nickel.

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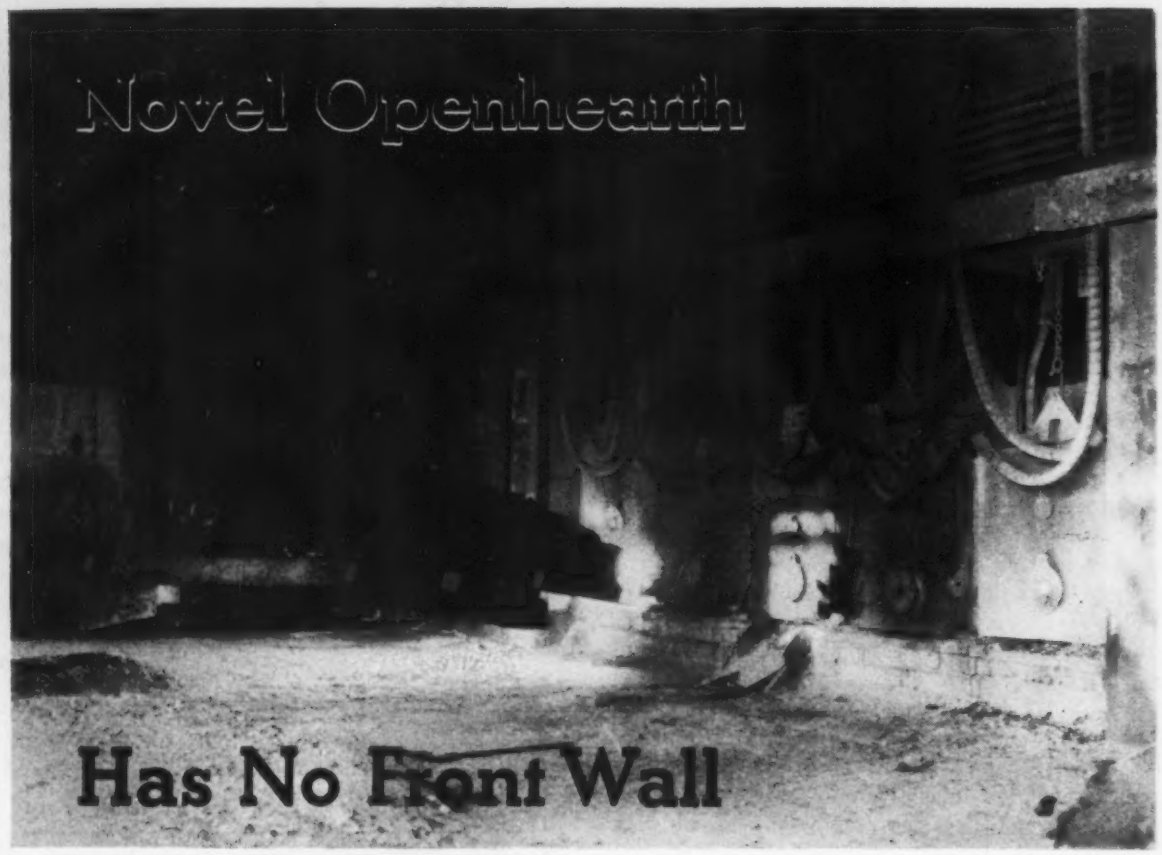
Novel Openhearth Has No Front Wall



BY S. ICHIDA
Technical Managing Director,
Amagasaki Steel Works,
Amagasaki City, Japan

and

D. I. BROWN
Feature Editor
THE IRON AGE

An openhearth design that eliminates front walls, arches and buckstays has been perfected by the Japanese. Much faster scrap charging is possible. Operating costs per ton have also been reduced.

A NEW type of openhearth furnace called the H. I. furnace, named after the engineers, Hiraoka and Ichida, has been developed in Japan and introduced into practice with distinct advantages over the conventional type. The furnace was specifically designed with two objects in view: Faster charging and longer life of roofs.

The furnace has a suspended roof and an all-door front eliminating the door jambs and arches in the furnace front wall. It has no front buckstays. The benefits of this type of design as experienced at Amagasaki are listed on p. 87.

The H. I. furnace has been in successful operation since January 1949, at the Amagasaki Steel Manufacturing Co. in Japan. The furnace design was perfected during a preliminary run of 100 heats.

Consideration has been given in the past in the U. S. to a similar design with the purpose of rapid charging and the use of the suspended roof is being tried in the U. S. and Canada, but no design of a furnace combining these features has been perfected in the U. S. Therefore, the results of the operation of the H. I. furnace are

being watched with interest by openhearth men in the American iron and steel industry.

The use of oxygen in all cold metal openhearth shops has speeded up operations and demands a faster method of charging scrap. Without faster charging, much of the time saved in melting is lost. The engineers at Amagasaki have built a furnace specifically designed to produce faster charging methods, so that the maximum benefit can be obtained from the use of oxygen.

The H. I. furnace has only one door. As now used in Japan, it is an 80 gross ton basic furnace of conventional design except that it has no front buckstays and has a suspended roof. The frame across the front is made of heavy girders, riveted and water cooled. Operations have proved this unit sound. In the initial campaign, no oxygen was used, because none was available, but an oxygen generator will be built and used in later campaigns.

An important change in design which was made in this unit was the method of supporting the silica brick roof. Each brick is independently suspended in the arch between the back and front water-cooled skewback as shown in Fig. 1. To allow for irregular roof expansion, the front skewback is supported by two structural steel arms placed between the main supports. A close-up of this design is shown in Fig. 2. All five water-cooled doors can be opened to allow almost unlimited speed in charging. Unprepared scrap of the largest sizes can easily and speedily be charged.

To date, the standard type charging machine is used. In order to obtain the maximum benefit from the furnace, a new type charging machine has been developed. The new machine will charge the pieces sideways over a false bottom which will permit rapid charging of the furnace with long pieces of scrap. With this machine, scrap up to 21 ft long, weighing an average of 5 tons can be charged into the furnace depending upon the type of scrap.

TABLE I

FURNACE DESIGN

Items	Figures Adopted
Furnace capacity	80 g t per charge
Bath area per ton	430 sq ft
Bath depth, average	22 in.
Bath width/length (ratio)	0.394
Max. sectional area	92 sq ft
Height of roof	80 in.
Length of port/bath length (ratio)	0.303
Furnace volume	2680 cu ft
Uptake area	37 sq ft
Roof thickness	10 to 12 in.
Number of doors	5 with magnesia lining

Placing long pieces of scrap lengthwise on the hearth, favors smooth flow of the flame over the charge and prevents its deflection up against the roof, thereby prolonging its life.

Fig. 3 shows the furnace lines and details of construction. The major specifications of the new furnace are shown in Table I. Table II shows the operating costs of the new furnace as compared to those of a standard furnace in Japan.

The figures for the new furnace do not include savings resulting from the use of unprepared scrap of large size. Most of the steel made in this shop is 0.15 to 0.20 pct carbon. As yet, unprepared scrap has not generally been used, but will be when the new charging machine is ready.

The importance of cooling methods has been

TABLE II

COSTS OF PRODUCTION
per gross ton

	Standard Furnace		New Furnace	
	Yen	Dollars	Yen	Dollars
Raw materials	4,975	13.80	4,732	13.10
Refractories	950	2.68	320	.88
Fluxes and alloy additions	1,302	3.61	1,025	2.84
Fuel	1,282	3.56	1,216	3.38
Repair cost (labor and material)	872	2.42	258	.72
Cost of other dept. allocated	2,350	6.53	1,515	4.20
Labor cost	1,125	3.12	813	2.26
	12,856	35.72	9,879	27.38

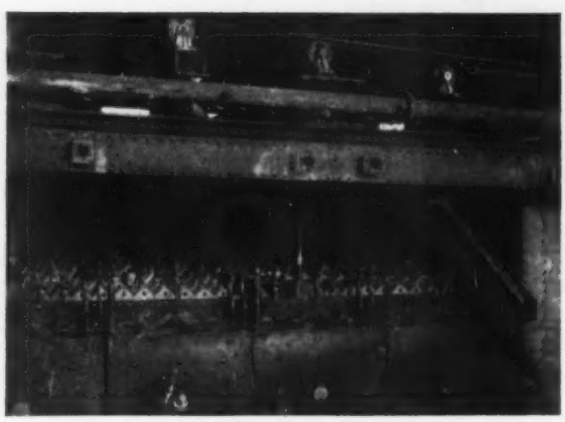


FIG. 1—Individual brick suspension is used. The usual front skewback and spring tension on the roof is not employed in this design.

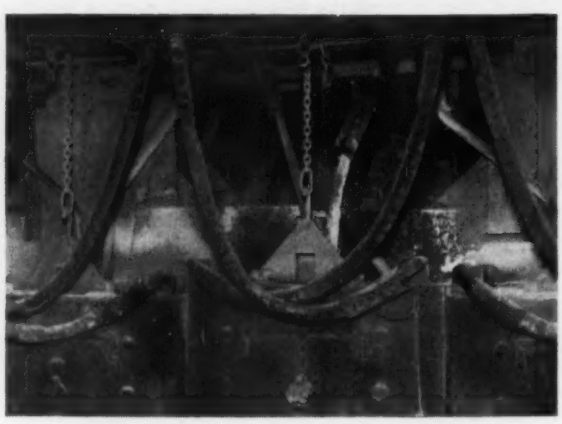


FIG. 2—A closeup showing detail across the top of the water-cooled doors.

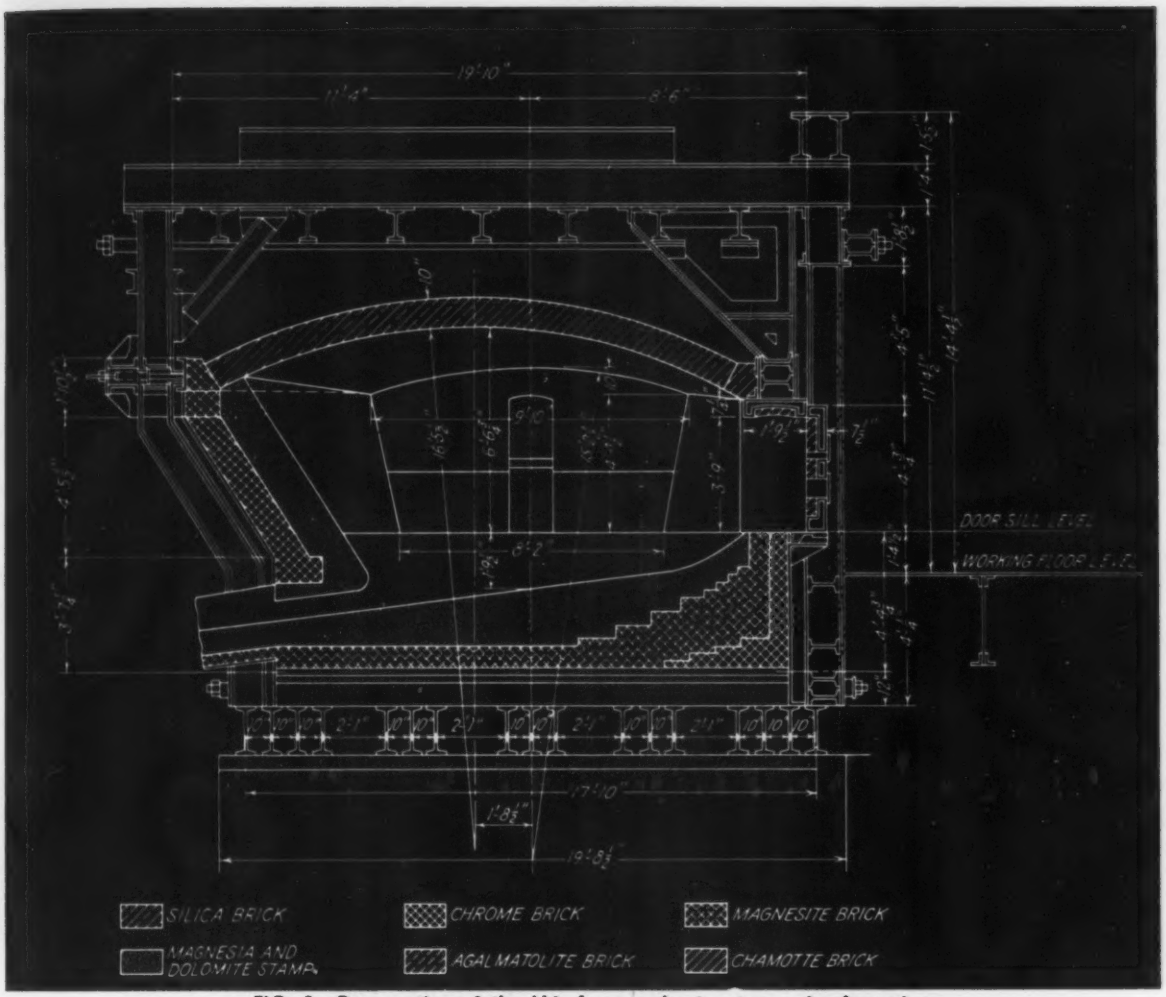


FIG. 3—Cross-section of the H.I. furnace showing types of refractories used and general dimensions of the furnace now in operation in Japan.

studied and applied to the new furnace. Approximately 750 gpm of cooling water are used. A heat balance study showed that, since the entire front consists of water-cooled door, the radiation loss of the new furnace was less than that of the standard type furnaces. Another advantage was the better working conditions in front of the furnace for the melter. In addition, repair time of brick was shortened. Table III is a summary of the heat balance study.

Eventually, the furnace design will be further modified to take advantage of the experience gained in its initial campaign. This includes altering the construction of the front skewback, special protection of the wing wall bricks and installation of the new charging machine.

ADVANTAGES OF THE FURNACE

1. Uniform and rapid charging possible.
2. On oversize scrap 5 to 10 pct of ingot cost has been saved through less scrap preparation.
3. Rapid bottom repairs are possible.
4. No repair time of the front wall.
5. Scrap is closely packed, longitudinally, and dense, so that it heats and melts faster.
6. Roof can be repaired partially during operation.
7. Furnace productivity is increased at least 20 pct.

TABLE III

HEAT BALANCE OF FURNACE

	New Type Furnace		Standard Type Furnace	
	Typical Heat	Avg. of 70 Heats	Typical Heat	Avg. of 70 Heats
Oil rate—gal./G.T.	45	31	31.6	38.9
1. Latent heat in fuel	100 pct	100 pct	100 pct	100 pct
Total	100 pct	100 pct	100 pct	100 pct
1. Heat content of steel tapped	31.8 pct	25.6 pct	25.9 pct	21.5 pct
2. Heat content of slag tapped	8.8 pct	7.1 pct	6.9 pct	5.9 pct
3. Reduction of ore	1.2 pct	1.0 pct	0.9 pct	0.8 pct
4. Exothermic reaction (minus) oxidation of Fe	−20.0 pct	−16.1 pct	−18.6 pct	−16.0 pct
5. Heat into cooling water	24.5 pct	23.5 pct	13.1 pct	11.3 pct
6. Loss in dry stack gases	34.1 pct	31.0 pct	31.5 pct	27.0 pct
7. Loss-walls, radiation, etc.	19.6 pct	27.9 pct	41.2 pct	49.5 pct
Total	100 pct	100 pct	100 pct	100 pct

Patents covering design of this furnace have been applied for by H. A. Brassert Co.

Blast Furnaces OPERATE WITH All-Carbon Linings

by G. D. ELLIOT
United Steel Companies, Ltd.
Sheffield, England

Following up its successful use of carbon boshes to minimize breakouts, United Steel Companies has added carbon stack lining to reduce scabs and scaffolding. Three all-carbon blast furnaces are now operating. To date linings have stood up well, production has been increased. Savings will more than cover higher initial lining cost.

EXPERIENCE gained at Appleby-Frodingham Steel Co. in recent years has shown many advantages of carbon brick as a blast furnace refractory. In 1945, two 17-ft furnaces were relined from floor to mantle with carbon brick, except for the tuyere belt. These boshes, and two similar ones, are still in service and have given no trouble whatsoever. Test drillings show that the brickwork is still intact. This work was reported in a previous article.[1]

The research with carbon brick was originally undertaken when our new theory of the cause of breakouts lead us to believe that carbon brick would be less susceptible to breakouts than fireclay brick linings. In blast furnace operation, there are other troubles than breakouts, such as scabs and scaffolds. Our research into the causes of these troubles led us to believe that these, too, could be materially reduced by use of carbon brick in place of fireclay brick as a refractory. We believe that factors in promoting scabs and scaffolding are carbon deposition and alkali attack. Our laboratory work showed carbon brick to be immune to both of these factors.

Our biggest worry in conjunction with using carbon in the stack was burning in carbon dioxide. We came to the conclusion that the risk was not as great as might first be thought, for a number of reasons: The coke against the wall is more reactive than the wall because of its greater porosity, and it is at a higher temperature than the wall. The coke has first contact with the gas. Deposited carbon from cooler zones above is usually present. And, CO_2 in the gas at the dangerous temperature zone is only about 4 pct, with a lot of CO and N_2 present to act as inhibitors.

Late in 1948, the carbon situation was again reviewed and it was felt that the time was opportune for a full furnace trial. Furnace No. 6 was due for relining and it was decided that no fireclay bricks should be used anywhere below the throat armor except around the taphole. The throat armor was left as standard because no trouble has so far been encountered in this area.

The use of only 13½ in. of carbon in the bosh

[1] *See "Carbon Linings for Blast Furnaces," by J. H. Chester and G. D. Elliot, The Iron Age, Aug. 18, 1949, p. 89.*

had been so successful that it was decided to use only 9 in. in the bosh of No. 6. This, together with a little juggling of the lines, permitted some enlargement of the furnace within the existing casing. It also meant that the operators could never ascribe furnace troubles to variations in the bosh line. Furthermore, if a 9 in. bosh were found to be successful in an 18 ft 3 in. furnace, there would be no hesitation in using say 18 in. of carbon, shower cooled, in a big furnace—leading to big savings in reduced copper construction.

The hearth of the furnace was built in corrugated design with small standard shapes used in hearth wall and tuyere belt construction. The hearth and bosh are shower cooled, using much less water than with a firebrick hearth. The tuyere belt is sparsely cooled with copper plates.

The tuyere belt is not plated—the bricks are exposed to the atmosphere. The bricks so exposed, at the points most remote from the coolers, show a surface temperature of about 230°F. In fact, all the conditions at this furnace are such as to give the lining material an almost unfair test—the purpose being that if carbon stands up in No. 6 it will certainly stand up in a big furnace.

Most thought was devoted to the question of insulation of the stack. It was felt that stack cooling could be dispensed with. The higher

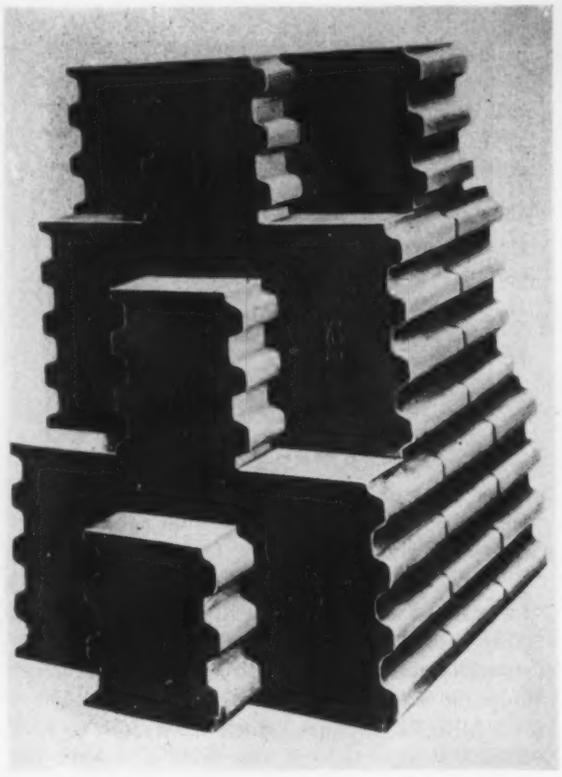


FIG. 1—Corrugated carbon blocks of the type used in United Steel Companies blast furnace bottoms.

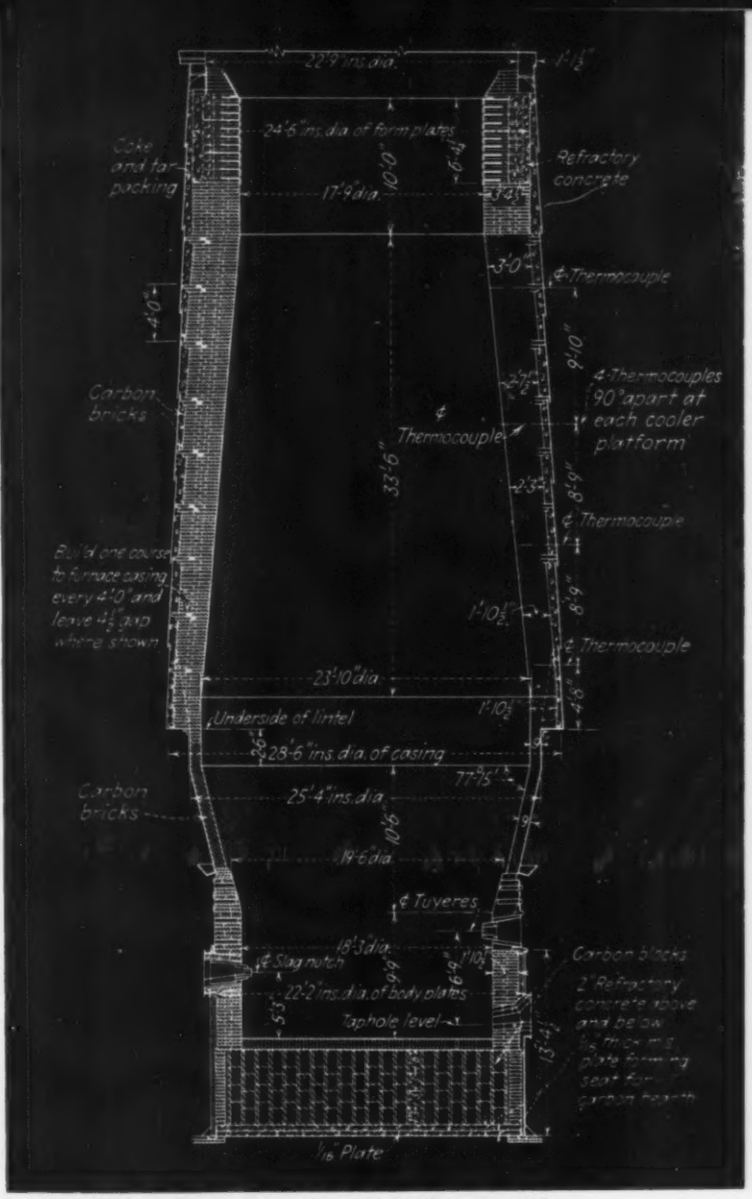


FIG. 2—Cross-section of United Steel Companies' No. 6 furnace from bottom to throat, showing the all-carbon lining.

conductivity of carbon showed that without insulation, shell temperatures would be higher than 392°F at the lower levels so that insulation was essential. The fear of carbon deposition led to the adoption of a carbonaceous fill for insulation. It was also essential that some measure of cushioning be provided—too many shells have been ruptured because a solid fill has been used between bricks and shell. Provision was made for shower cooling the shell when relining, and all stack cooler holes were plated over and welded. We have found it neeessary to use shower cooling but this is a fault of design, not a failure of carbon as a refractory.

The furnace was blown in on Apr. 4, 1949. Since blowing in, the furnace has made more iron at a lower coke rate than it did in the equivalent period of its previous campaign. Much of this is doubtless due to the present furnace being slightly larger, but that enlargement was only

possible because carbon was used. That alone has paid for the extra cost of the carbon installed. In any case, the extra cost is negligible per ton of iron produced if anything like a normal campaign life is achieved. An increase in campaign life is anticipated. If the incidence of scaffolding is at all reduced, the extra cost will be easily offset.

What is the cost? One can ignore the cost of carbon below the tuyeres because the use of carbon in the hearth is now standard practice and it is justified in reducing the incidence of breakouts. In the case of No. 6, the extra cost to build the furnace in carbon was of the order of $22,400 but the proper way to look at the problem of cost is to apply to a big modern furnace the modification which only carbon can make possible.

Remember that the weight of carbon to build a given volume of brickwork is only ¾ the weight of fireclay brick required, when comparing the cost per ton of carbon and of fireclay brick. An appraisal of the factors involved can lead to the conclusions shown in the box on the next page.

Because of better refractoriness and abrasion resistance, it is safe to use a thickness of lining less than that normally employed with fireclay brick. This means a bigger furnace in an existing casing; the bigger furnace can be used to make more iron or the same amount of iron at a better efficiency. In the case of a new furnace, it means a smaller shell for a given furnace.

Carbon should increase the overall campaign life of a furnace. Construction can be greatly simplified also. The author is convinced that carbon in the bosh will permit, with complete safety, a return to old fashioned shower cooled bosh jackets—and they need not be as messy as many think. This type of bosh is much cheaper than the usual elaborate copper plate cooled bosh, is quicker to build and results in appreciable savings in water and pumping costs.

Stack cooling may no longer be necessary. Hearth cooling can be effected satisfactorily by simpler and cheaper methods than the present system of heavy cast iron chills. A carbon furnace should maintain cleaner lines than a ceramic furnace. Efficient insulation of the stack will reduce heat losses from the stack. Any one of these points—except the last—is sufficient to offset the extra cost of carbon.

Heat Losses Through Carbon

Temperature gradients have been obtained through the stack lining of No. 6, and the results are shown in Fig 3. The importance of accurate knowledge of gradients cannot be overestimated, since so many design features depend on heat transmission.

As regards the hearth, experience confirms that heat losses are little different for carbon or fireclay linings. The lower thermal conductivity of fireclay brick is offset by the fact that there is always a reduction in its thickness after a short period of service.

As regards the stack, heat losses can be largely eliminated by efficient insulation. The high thermal conductivity of carbon introduces certain problems here. An inwall temperature of over 1850°F must be expected, which means that the interface temperature will be near the safe working limit of the more commonly used insulators. After consideration and examination of many insulating materials, vermiculite appears to be the most promising material.

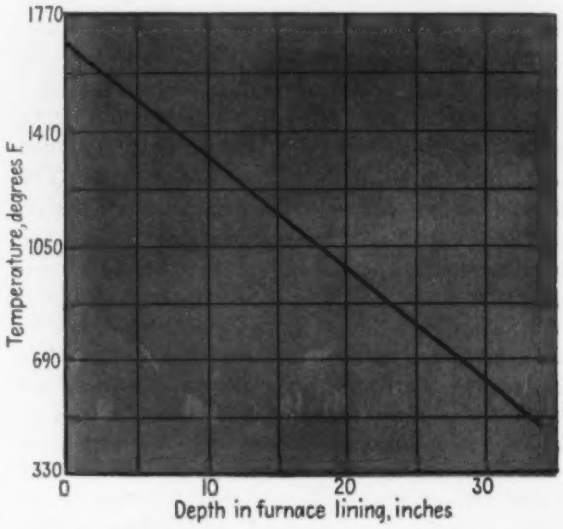


FIG. 3—Temperature gradients through the stack lining of the carbon-lined No. 6 blast furnace.

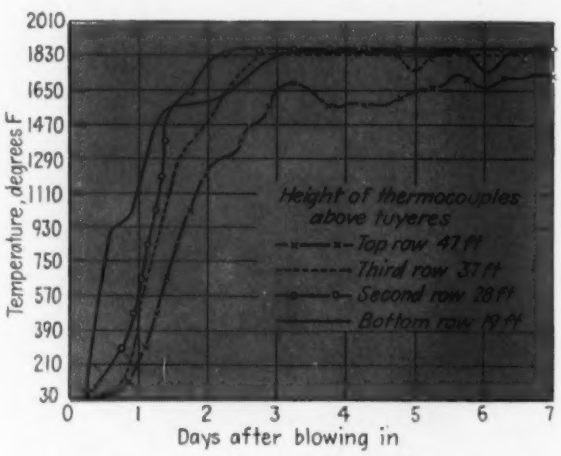


FIG. 4—Thermocouple readings taken in the stack lining of an all-carbon blast furnace during first few days following blowing in.

In order to avoid possible danger to the carbon arising from the delayed evolution of the water of constitution in vermiculite, vermiculite bricks should be used next to the carbon with loose vermiculite fill behind. Such materials as slag and rock wool, asbestos and diatomite have too low a safe maximum temperature and coke breeze gives too high a shell temperature. This latter point is only important from the viewpoint of

operating comfort, as the heat losses from the stack in terms of carbon per ton of pig are negligible.

All the bricks used in No. 6 were delivered from the kilns to the site, where they were protected from the weather. No preliminary drying of the furnace was carried out by any means whatever. Four rows of thermocouples were placed in the stack and a vertical row of four were coupled before blowing in. The record from these four for the first few days is shown in Fig. 4. This is of more than passing interest, as it is what happens in every furnace as soon as wind is introduced. The stack refractories cannot be brought to service temperature as slowly as the brick makers say.

Rapid Heating Harmless

The curves show that the carbon was put to work quickly. The thermocouple noses were 2½ in. behind the working face, and inspection a few weeks later showed that the 2½ in. was still present, so the rapid heating had done no apparent harm.

Pieces of carbon brick used to support the thermocouples were recovered during this inspection and submitted to laboratory tests. The only change that could be detected was that alkalies had been absorbed—4 pct K_2O and 0.24 pct Na_2O. This had been expected and had been studied in the laboratory before relining. Prolonged soaking in alkali vapor may saturate the brick with alkali salts but no reaction takes place with the brick, as it does with fireclay bricks.

In spite of no drying, the first cast was very successful. Twenty-three hours after putting wind on, No. 6 was tapped, using about 8 ft of oxygen lance.

Better Stack Insulation Needed

After the furnace had been blowing for 5 months, it was taken off blast for a few hours to permit a full examination of the stack brickwork. It was found that in all places examined, the tarry component of the coke tar fill between bricks and casing had coked so that the space was occupied by coke breeze. More temperature gradients were taken and showed that the breeze was acting as a fairly efficient insulator. With an interface temperature of as high as 1100°F, coke breeze cannot reduce the shell temperature to much below 300°F, which is an uncomfortable temperature, although not a dangerous one. This examination, therefore, served to confirm what has been said earlier about insulation.

As mentioned earlier, each stack thermocouple was protected by 2½ in. of brick. At several places, this was still intact although at other places it had disappeared. It is believed that these latter places were not failures of carbon but weakness in construction. A piece of brick 2½ in. long has very little mechanical stability in a furnace wall.

INDICATED BENEFITS FROM CARBON LINING

1. Increased campaign life.
2. Simplified construction.
3. Elimination of stack cooling.
4. Simpler and cheaper hearth cooling.
5. Less chance for formation of scabs and scaffolds.
6. Reduced lining thickness requirements.

The lining was also drilled at numerous places remote from the thermocouple holes and at these places, the wear was less than 1 in. Considering the crude means of measurement and the difficulties of measurement, it is probably safe to say that the wear on the lining after 5 months' operation was virtually nil.

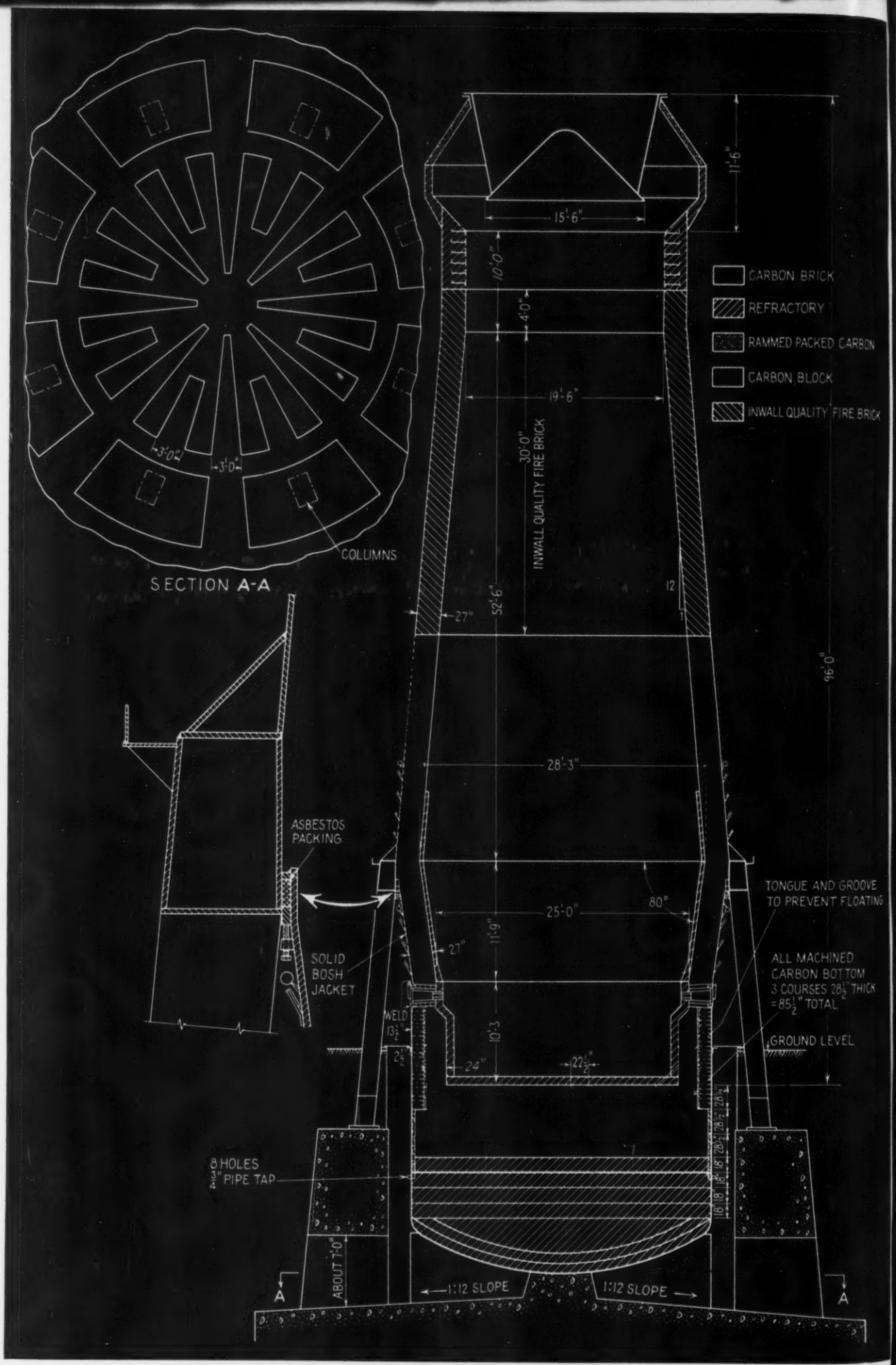
Carbon Stays Hard and Clean

Drilling speed indicated that the carbon after service at high temperatures was as hard as before service. This statement is made because drilling times through hot carbon were identical with drilling times, using the same gear and the same operators, made on cold carbon.

At all places examined, about 20, the working face of the brick was absolutely clean with no sign of scabs.

The results obtained to date with furnace No. 6 have certainly not been discouraging and it was decided that a second furnace, No. 1, should be relined in carbon throughout, with vermiculite insulation of the stack; No. 1 is much the same furnace as No. 6, although situated in a separate bank of furnaces. It was relined in 1945 with a carbon hearth and bosh, the hearth being of the early dome design. No trouble had been experienced in hearth or bosh but a great deal of trouble had been encountered in the stack; scabs, brickwork growth, and failure of the top brickwork. The furnace was blown out on Sept. 14, 1949, relined, and was back in operation Oct. 24, 1949.

Our operating staff is convinced by results so far that carbon is a worthwhile blast furnace material. It should be stressed, however, that until another two or three years of experience has been obtained, the carbon furnace must be regarded as an experiment only, though one now of considerable magnitude.


SECTION A-A
3'-0"
3'-0"
COLUMNS
11'-6"
15'-6"
10'-0"
4'-0"
19'-6"
30'-0"
INWALL QUALITY FIRE BRICK
52'-6"
27"
12
96'-0"
28'-3"
CARBON BRICK
REFRACTORY
RAMMED PACKED CARBON
CARBON BLOCK
INWALL QUALITY FIRE BRICK
ASBESTOS PACKING
SOLID BOSH JACKET
WELD 13½"
2½"
25'-0"
80°
11'-9"
27"
10'-3"
24"
22½"
TONGUE AND GROOVE TO PREVENT FLOATING
ALL MACHINED CARBON BOTTOM 3 COURSES 28½" THICK = 85½" TOTAL
GROUND LEVEL
28½
28½
28½
18"
18"
18"
16
8 HOLES ¾" PIPE TAP
ABOUT 7'-0"
A
A
1:12 SLOPE
1:12 SLOPE

NEW American Blast Furnace

DESIGNED FOR CARBON LINING

By H. A. BRASSERT
Chairman of the Board,
H. A. Brassert Co.,
New York

A blast furnace designed to use carbon lining inside an all-welded gas-tight tank is revealed here for the first time. All water cooling is done on the outside. The furnace has no cooling plates in hearth, bosh walls or inwall. Higher costs of carbon block are offset by much less copper, piping and maintenance. Greater volume of the furnace within a given shell is achieved by the thinner carbon lining.

MOST blast furnace men in the leading iron making countries agree that carbon blocks in the quality made today are a superior material for blast furnace linings in respect to resistance against high temperatures and abrasion. Also the carbon block has less tendency to cause adhesions and scaffolds. The experience at the Appleby-Frodingham plant of United Steels, presented by J. H. Chesters and G. D. Elliot, (THE IRON AGE, Aug. 18, 1949) and by Mr. Elliot's recent presentation in this issue of THE IRON AGE, corroborates this fact.

Carbon linings may eventually take the place of fire brick linings, not only in the hearth and bosh but in the inwall as well. How soon the development of an all-carbon lining will be completed for general adoption by American blast furnaces, will depend on the perfection of design and degree of physical quality of the carbon blocks and the proper design of the lining to control cooling. However, just as important, is the design of the blast furnace structure itself to prevent infiltration of air and moisture. Presented in the illustration is a design for a new blast furnace which will fulfill this purpose.

To use carbon lining effectively, it is necessary to prevent the penetration of air and particularly of moisture into the carbon lining of the furnace. It is known that H_2O, upon contact with carbon at temperatures such as exist in the lower zones of the blast furnace, quickly dissociates forming hydrogen and oxygen. The liberated oxygen will, of course, eagerly attack the carbon. This is particularly dangerous in the bottom of the hearth where incandescent coke is, for most of the time, not in contact with the bottom blocks. Only the carbon in the molten metal is there for protection. Therefore, any moisture left in the bottom brick underlying the carbon blocks, or moisture rising up through the foundations, will have a detrimental effect upon the bottom blocks.

This emphasizes the importance of thorough drying over sufficient time when a carbon hearth is used and the advantage of a tight shell around the bottom as well as the sides of the hearth. In the English practice at United Steels, a layer of sheet steel is placed below the carbon bottom to keep out moisture. This has also enabled them to blow in after a much shorter drying period than the usual one practiced.

Use an Air-Tight Tank

A recently designed American furnace shown at left is the equivalent of an air-tight, gas-tight, moisture-proof pressure tank. With such a bottom the old troubles with salamander are eliminated.

In our present furnaces moisture may come in contact with the lining through leaking cooling plates and moisture infiltration may occur with older shells through cracks and seams. In the new design, all cooling inside the lining has been eliminated except, of course, for tuyere and cinder notch coolers. There are no cooling plates,

either in hearth or bosh walls or in the inwall. The entire furnace is of heavy welded construction and has a welded steel inverted dome-shaped bottom. The entire furnace is gas-tight, making it also well suited for pressure blowing for the higher super-pressures which will, undoubtedly, be used in the future when the proper preparation of raw materials has been fully adopted. At the mantle, a special design gas-tight slip joint has been provided with suitable packing to withstand any pressure which may exist at that point. This design allows for expansion of the bottom, hearth and bosh shell against the shell of the stack with no leakage.

Carbon Blocks Locked In Place

The design of the proposed furnace shell is shown in the drawing and also the proposed carbon lining. The round dome-shaped bottom has an inverted dome of fire brick lining inside, superimposed by specially designed interlocked carbon blocks which cannot float upwards either together or singly because they are wedge-shaped and the end blocks anchored in place by the side walls.

The carbon block in this new furnace is carried up on the hearth and bosh walls and in the inwall lining to within 30 ft below the stockline. In the U. S., it is probably not necessary to carry the carbon brick all the way up to the metallic stockline protection since U. S. brick makers through the years have developed inwall and top quality brick of such excellent abrasion resisting quality that the upper inwalls in our furnaces outwear any other part of the lining.

The serious wear on the lining generally starts at a point about 40 ft below the stockline where abrasion is aided by higher temperatures. The possibility of attack of the carbon lining by CO_2 released from limestone and carbonate ores must be considered. This is effective within a range of temperatures between, say, 1380° and 830°F. But any CO_2 released in that zone is protected by the coke carbon which is more porous and reactive than the carbon in the wall. Coke offers more surface area and is in more intimate and immediate contact with the CO_2, released from the raw materials and is at a higher temperature. Even at the tuyeres the oxygen in the air blast attacks and burns the coke carbon and not the carbon of the lining.

A furnace designed as the one shown is best cooled by spraying the shell of the lower inwall, the bosh and the hearth jacket. This is the most effective and by far the most economical method of cooling when only the shell is in danger of overheating. It requires the least amount of water because it is more efficient than the indirect cooling by conduction, from copper plates to brick and brick to shell, and the cooling effect is more uniform than cooling with plates inserted into the lining.

Also there is less danger of leakage as a result of muddy water and the supervision and control of the cooling system is more easily accomplished. Furthermore, the cooling of such a furnace is attained at a very considerable saving of the initial cost particularly in copper coolers. The only copper required is that for tuyeres, tuyere coolers and the cinder notch.

After making the furnace moisture-proof, there still remains the infiltration of moisture which occurs at the tapping hole. With each stopping of the hole, large quantities of moisture are introduced with the tapping hole mud. It seems desirable to replace this water by plastic substances free from moisture and oxygen. Such chemicals must have the quality of rendering the clay plastic, of hardening under heat and upon hardening, leaving the mass with a minimum of porosity and without cracks. There are thermo-setting materials which may fulfill these requirements and give the necessary plasticity with small percentages admixed with clay.

It is conceivable that with such a tapping hole mix, it may be safe to carry the carbon all around the furnace hearth provided the furnace is never allowed to be blown through the hole at casting time. Blowing the last bit of iron out of the hearth would, of course, always destroy any carbon lining around the tapping hole. Alternatively, approximately a 25 sq ft breast of super quality firebrick should be installed surrounding the tap hole area.

New Furnace Advantages

A furnace of this design will combine the following advantages:

1. The integrated welded steel construction carrying shell and columns, as first used in the H. A. Brassert design of the Chilean blast furnace, is considerably cheaper than the conventional mantle and column design.

2. The expense of copper cooling plates in the walls of hearth, bosh and lower inwall is saved together with the complicated water piping feeding these plates.

3. Cooling the shell by spraying requires considerably less water than the interior cooling by copper plates, because cooling of the surface of the shell directly by conduction is more efficient than the cooling indirectly from plates to brick and from brick to shell. The cooling of the lining is more uniform by this system.

4. The maintenance cost of a spray cooling system is less than that of the conventional cooling plate system with its intricate piping and valving; it is easier to supervise and to detect any irregularity in water distribution. The former nuisance of water spillage causing showers of rain around the furnace has been completely eliminated by appropriate skirting. Also, the specifications for cleanliness of the water are less.

SCRAP HANDLING
KEY TO FASTER MELTING

British Iron & Steel Institute investigations into the size-shape characteristics of bulk scrap reveal that optimum handling and charging conditions require proper scrap segregation and preparation. Bundling presses give both ease of handling and good bulk densities.

BY E. L. DIAMOND
British Standards Institution, London

THE limitation to the speed with which groups of large openhearth furnaces can be charged is the rate at which scrap can be supplied to the chargers. Any radical improvement in furnace design, making very much faster melting rates possible, would necessitate either scrap preparation on a large scale, or the introduction of new methods of bulk handling, or both. The development of bulk handling equipment without scrap preparation may be ruled out since scrap segregation or preparation is the basis of all such developments.

Scrap segregation, to be of real value, must be carried out according to some clearly defined limits of size and shape. Before attempting any large-scale and costly treatment of scrap there should be a clear understanding of the effect of the size and shape of individual pieces on the behavior of the mass as a whole. This, so such treatment can be designed to give well-defined results at the minimum cost.

Such preparation, presently carried out in the form of baling and flame cutting, is directed to the simple aim of producing individual compact pieces that will fit a charging pan. That is also the basis of scrap specifications. If, however, the scrap, or a proportion of it, is to be handled by conveyer, chute or other continuous mechanical means, such a criterion would be useless to prevent frequent blockages of one kind or another.

The purpose of this investigation was to ascertain the basic physical facts from which rules and limits can be formulated with some precision to satisfy the above requirements. From these, it was felt that some guiding principles could be derived both for designing new types of mechanical handling plants, and for a preliminary assessment of the economic return likely to be obtained from such a plant.

Classification Was Necessary

For the purpose of determining the effect of shape on the behavior of individual pieces, it is desirable that all the pieces in each quantity studied should be exactly similar. The pieces should also be fairly small. The first requirement raised the difficult question as to how the infinite variety of scrap could be represented by a relatively small range of shapes. The problem may therefore be visualized as how to systematize the infinite variety of shapes into which a single lump of plastic material can be deformed.

In the manufacture of steel products, the primary process is plastic deformation by rolling. The extremes to which this is carried are represented by sheets and rods. Casting is, from this point of view, a midway process which can only produce relatively compact pieces. Wiredrawing may be regarded as an extension to a further extreme of the process of rolling rods.

All rod-like products may be regarded as cylinders, or combinations of cylinders.

Sheets can also be viewed as cylinders if the cross-section, in this case the flat surface area, is very large compared with the length, now the thickness. It is relatively unimportant if the sheet is non-circular, departing from a true disk. It was therefore decided that the experimental material should consist basically of a series of cylinders of length/diameter ratio varying from approximately 0.02 to 20, i.e. from flat disks to long rods.

SCRAP HANDLING CONCLUSIONS

1. **To insure that bulk scrap can be successfully fed from a chute to a charging pan or a charging machine without hand trimming, individual pieces must either: (a) Not exceed determined maximum overall dimensions for a particular plant, usually of the order of 3 ft; or (b) not exceed a "shape ratio" of 6:1 between maximum and minimum overall dimensions in the three axes of the piece.**
2. **Segregation on this basis will not necessarily give the maximum attainable bulk densities.**
3. **Scrap preparation by bundling presses gives both ease of handling and good bulk density.**
4. **Scrap rejected because of being oversize would consist largely of material that could be bundled in a high capacity press to acceptable handling sizes.**
5. **Folding is twice as effective as cutting in dealing with scrap strip or sheet. This is true both for high bulk density and ease of handling. Large bundling presses are the most practical method of folding.**

With experiments on this material and a few compound shapes of the disk and rod or rivet-shaped variety, it was hoped to obtain fundamental knowledge that might be generalized so as to cover the whole range of scrap.

Bulk Handling Poses a Problem

There might be little difficulty in the mere transport of scrap on a conveyer of some kind provided only that it be big enough. Truck loads could be tipped directly onto such a conveyer and transported anywhere in a direct line. That, however, would contribute little or nothing to the solution of the real problem, which is how to get the scrap directly onto a charging machine without loading it piecemeal by a magnet crane.

If this problem could be successfully solved, the existing type of charging machine could be replaced by a machine with a reciprocating trough from which portions of scrap would be swept off at every stroke. The portion of trough to be filled at each stroke would be of the same dimensions as the present type of charging pan. It is evident that so long as steelmaking furnaces resemble the present types of openhearth furnace and are charged through the doors, the ability to discharge portions of scrap from the main supply line into a receptacle of this size is the crux of the problem. Proposals to charge through the roof or through a doorless front of the furnace are primarily attempts to evade this problem, and have no merits from the point of view of furnace design itself.

The most useful criterion for ease of handling would therefore appear to be some measure of the force required to separate one portion of a random heap of the scrap from another. Since gravity is obviously the most practicable force available, the type of experiment suggested is one in which measurement is made of the weight of unsupported portion of the heap that can be sustained by the internal coherence of a cross-sectional face of the whole heap.

The actual experiment decided upon was to determine the maximum width of opening in the flat bottom of a container which the contents will bridge. This gives a characteristic value for the breakdown force, or cohering stress, on the vertical sections above each edge of the aperture.

Surface Roughness Can Be Neglected

The effects to be investigated are dependent primarily on factors which are simple functions of the linear dimensions. Any secondary effects, such as surface roughness, can be safely neglected. The bulk density is the product of the density of the metal, which may be regarded as a constant so far as steel scrap is concerned, and the percentage volume of occupied space caused by random distribution. Provided the distribution is unaffected during filling of the container, the effect is subject to the laws of pure geometrical similarity.

As regards the breakdown force of the heap, the condition for perfect similitude is that the weight of the structure must bear the same ratio to the applied load for both model and original. As the load is solely that of the weight of the structure itself, this condition is fulfilled so long as the prior condition regarding bulk density is also satisfied.

Bulk density measurements were made in wide containers and are for random packing as obtained by dropping the pieces into the containers. The results are plotted in Fig. 1 against a logarithmic scale of L/D. On the same graph are plotted three elementary physical properties of the cylinders: (1) The major linear dimension, length of diameter, whichever is greater; (2) the surface area; and (3) the

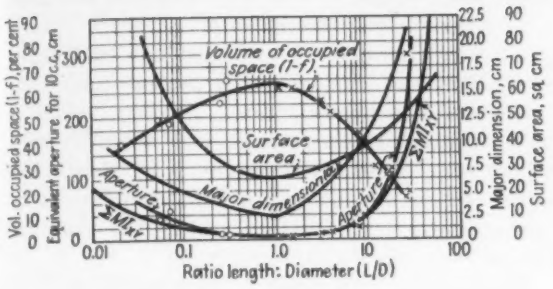


FIG. 1—Logarithmic plot shows experimental scrap handling results for length/diameter ratios on surface area, volume of occupied space, major dimension, and aperture compiled by the British Iron & Steel Research Assn.

sum of the moments of inertia about two mutually perpendicular axes.

The phenomenon of arching in loose materials packed in a container with an opening in the bottom is well known, and has been studied in connection with the flow of granular materials from bunkers. Preliminary experiments showed that there was a wide variation in the ability of heaps of cylinders of different L/D ratios to bridge a gap in the bottom of a rectangular container. Long thin rods, in the form of needle blanks for instance, form a heap so closely entangled that enormous quantities of them can be suspended by arching. Cylinders with a 1:1 ratio flow very readily through a comparatively narrow opening. This difference in behavior was clearly a direct manifestation of the property that was being investigated. The maximum breakdown or shearing force that can sustain the weight of suspended material, evaluated on the basis of a unit area of the vertical section above the edge of the gap or aperture, gives a figure characteristic of the heap.

Test Container Was Constructed

The container designed for the investigation had glass sides and a central aperture in the floor. It is shown diagrammatically in Fig. 2. If the friction of the sides is neglected, the shear force

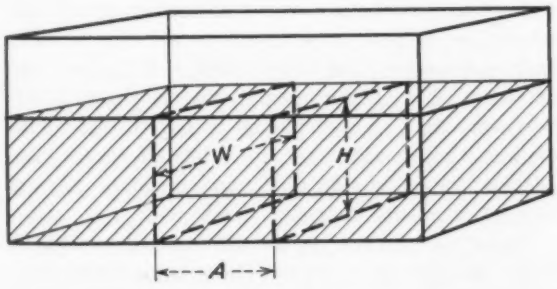


FIG. 2—The aperture test box had glass sides for observation of results.

per unit is $\frac{1}{2}\ \rho\ (1\text{-}f) \times A$, where ρ is the density and f the voidage. Since ρ and f are constant for any particular heap, it follows that A should be independent of the width of the container and of the height of the heap above the aperture.

A container of this description was constructed with a floor consisting of movable steel plates which could be slid back underneath each other. The averages of successive sets of ten tests show a comparatively small variation. By taking a sufficient number of tests, it was felt that a mean value would be obtained that could be repeated fairly closely. Series of tests with different heaps consisting respectively of simple and compound cylindrical shapes showed that above a certain level the mean aperture at the moment of breakdown was independent of the level, as required by the above hypothesis. The maximum aperture was determined in this way for heaps of every shape of piece. To reduce the results to a common basis, the equivalent values for pieces of uniform volume of 10 cc were worked out, the actual aperture observed being multiplied by the scale factor appropriate to each piece. The results are plotted in Fig. 1. It will be observed that they again give a series of values with a consistent trend clearly related to the shape of the piece.

Measurements of percentage volume of occupied space and the aperture test were carried out on four heaps of compound pieces representing respectively different combinations of disks and rods.

Volumes of occupied space and aperture measurements are in all cases lower than for either of the simple cylinders making up the compound shape. This means that such compound shapes would be easier to handle mechanically in bulk than the simple shapes but that they would give a lower bulk density.

The results for mixtures are very much nearer the lower of the two values, for both tests, of the component pieces. This means that the bulk density of such mixtures will be simliar to that of the worst element of the mixture. However, the ability to handle the more difficult element would be greatly improved by admixture of pieces of a more favorable shape.

Results Depend Upon Linear Proportions

The curves in Fig. 1 indicate that the results of both the voidage and aperture tests are related in some direct way to the linear proportions of the pieces. A simple theory provides a basis for a more generalized presentation of the experimental results for the simple cylinders. It also enables the results for the compound shapes and mixtures to be explained in a manner affording an exceedingly useful basis for the practical problem of scrap preparation for mechanical handling in bulk.

In Fig. 3 voidage f is plotted against the major dimension. To render the values independent

of absolute size, the major dimension is expressed as a ratio. Fig. 3 shows that within the range of the graph covered by the disks there is no significant divergence of the points for disks and rods. If the voidage is plotted against total surface area two diverging curves are obtained, one for disks and one for rods.

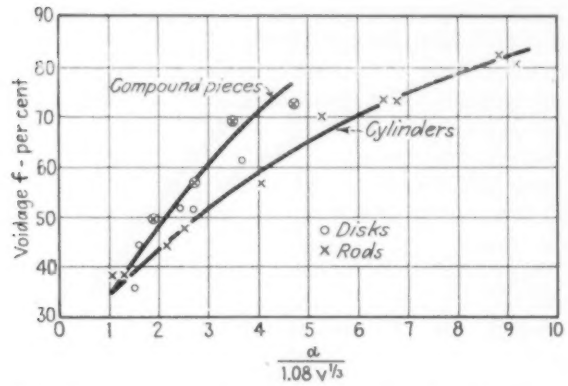


FIG. 3—These curves show the relationship of voidage to the major dimension.

Fig. 1 suggests that the results of the aperture test bear some relation to the sum of the moments of inertia about a longitudinal and a cross axis respectively. If they are plotted on this basis, two converging lines are obtained for disks and rods. This is also the case if the results are plotted on a basis of surface area, or on the basis of any function comprising the addition of the linear dimensions of their powers.

When breakdown takes place it is of the nature of failure by shear across the slip faces, wherever these may occur. Experiments have showed that the shear force may be calculated on the vertical face above the edges of the aperture.

At the point of breakdown, the shear resistance and shear force are equal. Using expressions for shear force and combining statements of proportionality derived theoretically, the two expressions shown in Fig. 4 were plotted and give a very good linear relationship.

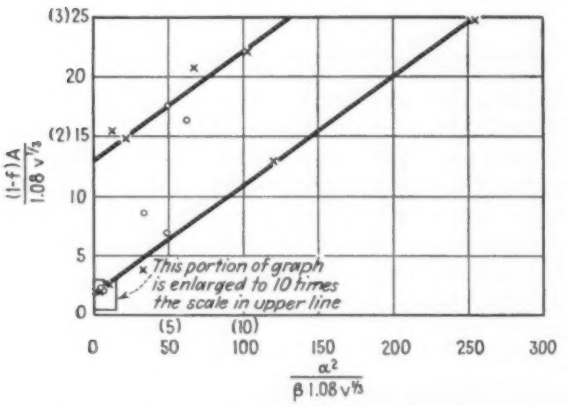


FIG. 4—These curves show the relationship of aperture test to major and minor dimensions.

Two experiments were carried out that serve to confirm a conclusion which can be fairly confidently drawn by deduction. This conclusion is that bending which encloses any space thereby made less accessible to neighboring pieces will cause the piece to behave, in respect of the properties under consideration, as if the enclosed spaces were wholly or partly solid.

The results of laboratory experiments such as those described are useful as a practical guide to the selection and preparation of scrap for bulk handling to the extent to which they show very strong demarcations in behavior. This, however, they do in a very striking manner, as a glance at the aperture curve in Fig. 1 shows. There is a comparatively well defined range of the ratio L/D within which plain cylindrical pieces can be satisfactorily handled. Outside this range their ability to hold up increases with surprising rapidity to what would be an almost unimaginable extent were it not for the fact that the limit of rigidity intervenes.

Twisted Scrap Is Easily Handled

Another important fact that emerges, contrary perhaps to what might have been expected, is that bent and twisted pieces will not be more difficult to handle than straight pieces of the same overall length. This is true when large quantities are being dealt with, though the bulk density obtainable will generally be lower.

It is also to be noted that what have been called compound pieces, typifying a common kind of scrap such as valves with bits of piping attached, will be easier to handle than if they were separated into their component pieces, though they will give a lower bulk density.

It must, therefore, be recognized that the selection of scrap for mechanical feeding to a high-speed charging machine will not necessarily improve the bulk density. This is a very important consideration, and shows that the whole problem must be considered in all its aspects and not piecemeal. It means that a bulk handling system might even be a failure in conjunction with existing types of charging machines because, in some circumstances, the average pan density could at times be reduced to a point at which the charger would fall behind the demands of the furnace. Take, for example, a heap of hollow drums. These might be of ideal proportions for feeding rapidly from a conveyer, but they would give a poor rate of charging with the normal type of charger. If, however, they were flattened to give a good bulk density they could, if in considerable quantities, become impossible to discharge mechanically on to a quick-acting charging machine.

Bundling presses, on the other hand, are right from both points of view. There is no doubt that this is the best way of dealing with all but scrap of heavy section.

Faced with a miscellaneous lot of mixed scrap,

how would it have to be sorted for bulk handling? It is assumed that all heavy pieces accord strictly with existing specifications, i. e., that no individual piece exceeds the limits of "furnace size." The criterion for the segregation of all but small pieces is the ratio of the major and minor overall dimensions, for which the limit would probably have to be set at not more than 6:1. By "major" and "minor" dimensions are meant the maximum and minimum of the overall dimensions in the three natural axes of the piece length, breadth and depth. For convenience this ratio is called the "shape ratio."

A piece of H-section girder 5 ft long by not less than 1 ft in width and depth would fall within this requirement, whereas a quantity of loose stakes or a piece of piping 4 ft long with a 1-in. width or diameter would not. It is of interest to observe that with individual pan loadings, as at present, the piece of girder, typical of ship-breaking scrap, is disliked because of its low bulk density in a pan. However, the stakes, if laid neatly along a pan, but with a great deal of expensive hand trimming, would give a very good bulk density.

Unfortunately, it would require much more expensive methods to reduce the girder to smaller dimensions than to bundle the stakes. For this reason it appears that scrap preparation might be a much more practicable and economical proposition for a wholly mechanized scrap charging system than it can be so long as its only object is to get a better bulk density by individual pan loading methods.

The principal difficulty that seems to arise is the prevalence of scrap in the form of pieces of plate. According to the suggested rule, a piece of plate 1 in. thick must not exceed 6 in. in length or width. However, there must also be a limit of absolute size below which any shape is acceptable. It would probably be satisfactory to fix this at a sufficiently high figure, say a maximum overall dimension of 3 ft, to overcome this difficulty to a large extent.

The bed of material on a conveyer would be kept relatively thin as compared with the levels in the aperture experiments necessary to give the maximum recorded aperture. It would also only be in the case of plate or strip mill scrap that large quantities of plates would be fed together on to a conveyer unmixed with other material. In such cases the experiments with a mixture show that difficulty could be avoided if it were possible to mix a certain proportion of, say, bloom ends with it. Failing this, care would have to be taken to limit the depth of plate scrap on the conveyer to a very low figure.

The principal type of rejected scrap that could not be bundled would be large pieces of thick plate. These could be handled efficiently by magnet crane with other rejected scrap, or be gas cut. In the latter case the bulk density would also be improved.

Considering mill scrap, bloom ends at present frequently exceed both the suggested limiting dimensional ratio and maximum dimension. It should not be difficult to shear these into shorter lengths while hot and at the source. The gain from being able to handle all mill scrap in bulk would make it well worth while.

New Books

"*Metallurgy.*" No. 3A of the Quarterly of Colorado School of Mines, contains papers delivered at the conference on metallurgy. It includes the topics: The trend of iron ore concentration in the Lake Superior district; utilization of fuels; current research in physical metallurgy; and metallurgical materials in the coal mining industry. Dept. of Publications, Colorado School of Mines, Golden, Colo. 50¢. 60 p.

* * *

"*A Dictionary of Electronic Terms,*" edited by H. L. Van Velzer, answers the need for an up-to-date reference source of words used in the rapidly expanding electronics field. Definitions cover mostly modern techniques and equipment, but range from words no longer in general use, retained for historic reasons, to the new language of color television and the electronics of nuclear physics. Allied Radio Corp., 833 W. Jackson Blvd., Chicago 7. 25¢ 64 p.

"*Principles of Engineering Economy,*" by E. L. Grant. The greater part of this third edition has been rewritten and a substantial amount of new material has been added. The book deals with planning economy studies to solve engineering problems; interest, the time element in economy; technique for economy studies and how to get results from them. Ronald Press Co., 15 E. 26th St., New York 10. $5.00. 624 p.

* * *

"*Year Book of the American Bureau of Metal Statistics.*" This twenty-ninth annual edition of the Year Book presents largely the same coverage as formerly, comprising statistical data relative to copper, lead and zinc, as well as the other nonferrous metals. As in past issues, general economic statistics of the U. S. are included. American Bureau of Metal Statistics, 50 Broadway, New York 4. $3.00. 112 p.

Radiant Furnace

A barrel-shaped radiant heating furnace at Ford delivers billets at a faster rate than they can be forged. Parts emerging from furnace are nearly scale-free. Little space is required and die life is high.

EXCEPTIONALLY fast heating of billets is attained in a barrel type, radiant heating Surface Combustion furnace at the new forge plant of the Ford Motor Co., Canton, Ohio. After heating, these billets are forged into pairs of knuckle spindle supports. The furnace requires only a small floor space but heats billets several times as fast as conventional box furnaces. In so doing, it avoids heavy scale. This results in a greatly increased die life as compared with ordinary furnace heating.

A 2500-ton Ajax press and a Bliss trim press are served by the furnace. Ultimately it is planned to add a set of forging rolls to preform hot billets so that a pair of forgings can be preduced in two press strokes. To date, the press has been equipped with dies having three impressions. These are used in succession for blocking, setup, and finish sizing where three working strokes of the press are required to complete the part.

With this die, 150 to 250 pairs of forgings an hour are produced. The furnace has a capacity for heating 340 billets per hr. These billets measure 1⅛ x 3¼ x 22 in. and weigh 23 lb each. Therefore, billets can be heated faster than the press now operates. A billet, a pair of forgings untrimmed, and a trimmed forging of the type made for Ford cars appear in Fig. 1.

FIG. 1—Progressive forging steps are shown by the billet, below, a pair of untrimmed forgings, middle, and a trimmed knuckle support forging, above.

The furnace, Figs. 2 and 3, is cylindrical and has tubular water cooled skid rails at the horizontal diameter running from the pusher at the feed end and bending downward at the discharge end. Fig. 4 shows the furnace with discharge door open and the press operator removing a billet that has just slid down the rails. The latter are supported by piers at each end at two intermediate points. Outside diameter of the barrel is about 6 ft. Overall furnace length is 12 ft.

Under the barrel is equipment for mixing air and gas in proper proportions and for feeding the mixture under 2 psi pressure to the ceramic

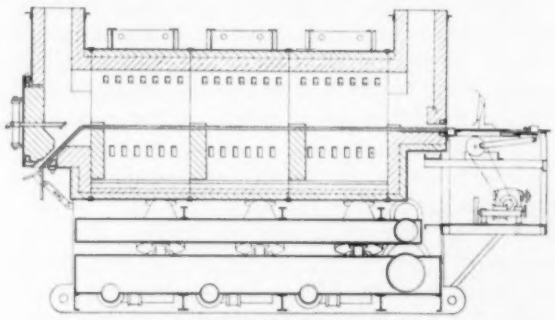


FIG. 2—View shows longitudinal section of the billet heating furnace. Accessory equipment supplies combustible gas mixture under pressure and pushes billets through furnace.

tipped burners. These burners are set to deliver the fast burning mixture at a relatively high velocity tangent to the bore of the lining.

As a result, the burning mixture revolves rapidly, hugging the walls of the cylindrical combustion chamber. The inner surface of the combustion chamber is heated to incandescence so that heat is radiated inward at high intensity. It is this radiation that heats the billets as they are pushed through the center of the combustion chamber. Combustion is completed at a high rate with corresponding release of heat. As the flame hugs the walls, it does not impinge upon the billets being heated.

Combustion Products Flow Axially

The atmosphere around the billets is composed of products of combustion that flow axially toward flues at each end of the furnace. For this reason, and because of the extremely rapid heating, only a light scale is formed. A minimum of decarburization and grain growth occurs. As the refractory used is (1) thick, (2) a good heat insulator itself, and (3) is covered by a layer of insulation, loss of heat by conduction to the steel shell of the furnace is moderate and the shell remains relatively cool. There is also little escape of heat into surrounding areas, as both inlet and

Speeds Billet Heating

By HERBERT CHASE

discharge openings are small and near the axis where combustion is complete. Air does not leak into the furnace because the pressure inside is slightly above atmospheric.

Billets being heated are supported on skid rails that are of ordinary steel pipe through which cooling water is circulated. Such pipe is low in cost and is easily replaced. A pusher is arranged to advance the billets from end to end at the required rate. They drop into a chute down which they slide to a station near the press. Here they are picked up with tongs and inserted into the die.

The pusher is adjusted to keep pace with the press operation and gas mixture is fed at such a rate as to make billets reach the press at the desired forging temperature. The rate for any given billet is held constant unless die or other troubles make it necessary to stop the press. In this case, the operator presses a button that actuates dampers. These provide a gas-air ratio such that a special protective holding atmosphere is maintained within the furnace. The pusher is also stopped.

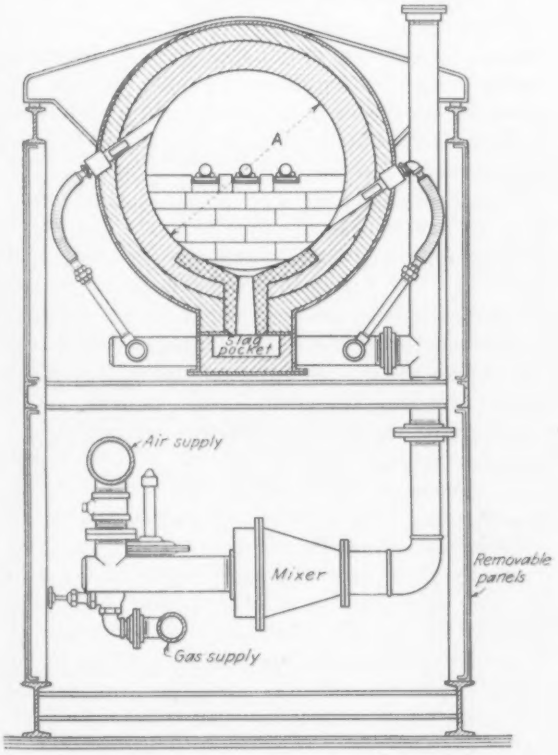


FIG. 3—Transverse section through the furnace shows skid rails made from pipe and two of the nozzles that deliver combustible mixture tangentially. Refractory walls, made incandescent by the swirling gases, radiate heat inwardly.

FIG. 4—Heated billets emerge from furnace by sliding down water-cooled skid rails. Pressmen lift them with tongs and carry them to the presses. Open discharge door shows furnace interior.

This arrangement is provided to avoid overheating billets already in the furnace and to prevent excessive scaling of these billets until the press is ready to resume production. Then the operator presses a second button that reverses the dampers. The pusher is again started and normal operation resumes. This arrangement is convenient and economical. It avoids losses of steel that might occur if the furnace continued at full temperature during press delays. Formation of slag from overheating billets in an air atmosphere is thus precluded, and fuel consumption is much reduced during the shutdown.

Billets Have Minimum Scale

When, as with this furnace, billets have a minimum of scale and are very light, die life is increased and there is less chance of scale being embedded in forgings. It is also in the interest of economy to keep the press supplied with heated billets fast enough for it to run at rated capacity, or at least as fast as the necessary forging operations can be performed. Production executives of the plant indicate that these furnaces are among few capable of keeping billets supplied to presses as rapidly as they can be operated.

After the forgings leave the forging press, they are passed to Bliss trim and restrike presses while still hot. Overall production is higher than for corresponding hammer die forgings. Operation requires less skill since there is only one working stroke for each pair of die impressions and the pressure applied is independent of the operator.

Self-Centering Rolls Eliminate Guides

IN the movement of metal strip over rolls and pulleys, obtaining proper tracking is a major problem. It is particularly difficult if the strip is thin and wide.

It is necessary to use auxiliary guiding mechanisms such as power-actuated tilting or shifting rolls and edge guides in conjunction with aids such as high belt tension and free hanging loops of the strip. These correct the cumulative lateral weave which occurs as the strip is forwarded over the rolls or pulleys.

These become less effective as advances are made in strip production and processing. Coils are larger, processing line speeds are greater, and processing lines are longer. So guiding problems are increasing. Particularly, edge damage is troublesome. It is not practical to keep strip tension at the very high levels needed to overcome lateral weave.

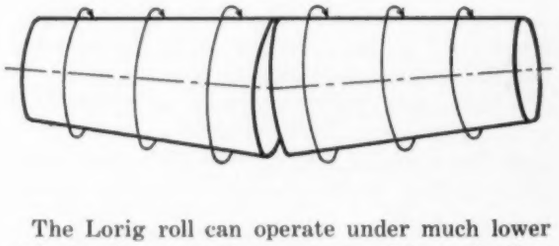
The methods used in governing the tracking of such materials as rubber, textile or leather belting, are not effective with metal. For example, they do not apply where permissible tensions in processing do not provide sufficient resilience within the elastic limit. Low modulus materials can temporarily deform both longitudinally and laterally, and thus will track satisfactorily over conventional cylindrical or crowned rolls. But the modulus of elasticity of metal is too high for this.

A new solution to these problems will be described next week at the 1950 Fall Exposition of the Iron and Steel Institute in a paper by E. T. Lorig, chief of the senior engineering staff of Carnegie-Illinois Steel Corp. Carnegie's engineering staff has developed a new type of roll, which automatically exerts a continuous centering action on strip passing over it.

Working Surface Horizontal

The Lorig roll is a slightly crowned roll cut in half at the center of its axis. The two halves are arranged to rotate as a unit. Each half is tilted enough to compensate for the amount of crown, so that the working surface is horizontal. In the diagram, the working surface is on top, and each half has been tilted up. Any point on the surface of either half rotates, as shown, in a plane tilted toward the center of the roll. As the point moves across the top of the roll, it is thus moving in the direction of rotation, but also slightly toward the center. Therefore, as it contacts the material moving over the roll, it exerts a force on the material with a component in the direction of rotation, and a component toward the center.

Thus, with each half of the roll in effect trying to push the material toward the other half, the roll automatically and continuously exerts a centering force on material passing over it.



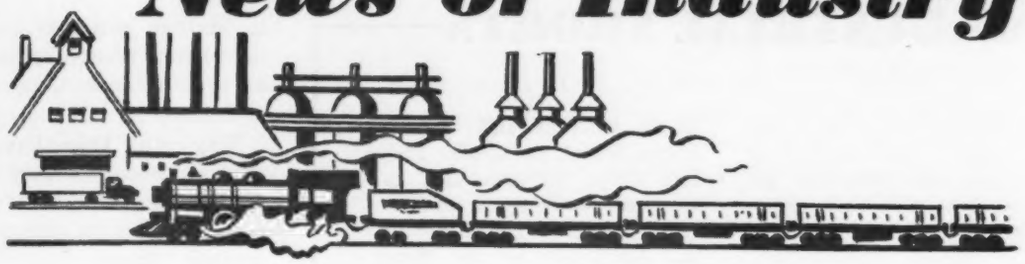
The Lorig roll can operate under much lower strip tension, and edge contact guides and other auxiliary guide mechanisms can, in most instances, be entirely eliminated. In the rare instances where side guides might be needed, the pressures of the strip, regardless of width, will be reduced to a degree such that edge damage cannot readily occur.

Flat steel conveyer and power transmission belts, in some instances, are known to be more efficient than materials commonly in use. But they have lost favor for possible use in many desirable applications because of tracking difficulties under reasonable belt tensions. The Lorig roll makes such applications possible. With closed circuits, represented by metallic belts which make repetitive cycles in operation, extremely low belt tensions can be utilized if desired. Accurate tracking can be secured without resorting to auxiliary belt guiding means.

While the automatic centering Lorig roll was primarily developed for more naturally tracking and aligning metallic strip and belts, the rolls can be equally effective in other types of equipment and in other industries. Paper, for example, presents similar problems in tracking over rolls, since with paper low tension is obviously necessary.

At the present time, Lorig rolls are in satisfactory operation in various steel mill applications, chiefly in processing of the products of continuous hot and cold strip mills.

News of Industry



Ductile Iron's Future

Swampscott, Mass. — Ductile iron will become the third important engineering material tonnagewise, following steel and gray iron, predicted A. P. Gagnebin of International Nickel Co., Inc., at the Massachusetts Institute of Technology conference on ductile iron held here last week.

Mr. Gagnebin said that annual production of ductile iron holds promise of reaching between 2 and 5 million tons annually in the next few years. He also pointed out that broader use of ductile iron would help conserve manganese, currently difficult to obtain.

Butadiene Plant to Reopen

St. Paul—Contract for re-activation and operation of a $22 million government-owned synthetic rubber plant at Torrance, Calif., has been awarded Minnesota Mining & Mfg. Co. and Pacific Rubber Co. The plant has a capacity of 60,000 tons of butadiene rubber.

Dravo Builds New J&L Barges

Pittsburgh — Dravo Corp. is building nine new coal barges for Jones & Laughlin Steel Corp. for transporting coal from mines to mills. Each barge will be 175 ft long by 26 ft wide. Dravo also is building towboats for J. & L.

Bjorksten to Build Test Unit

Madison, Wis.—A 168-acre tract of land near Madison has been acquired by Bjorksten Research Laboratories, Inc., for buildings to house new testing units, scientific equipment and laboratories.

Murray Stirs Boiling Steel Wage Pot

Steelworkers gunning for raise of 23¢ an hr . . . Some steel people would give 5¢ or 6¢ cost of living boost . . . But big increase would mean higher steel prices—*By Tom C. Campbell.*

New York—Phil Murray's steelworkers are going to get some kind of a raise in pay before long. How much it will be depends on negotiations which will start officially by Nov. 1. There have already been unofficial discussions between Mr. Murray and one steel firm—U. S. Steel.

Just how much Mr. Murray's boys will get is a serious question and one which is open to crystal gazing. In preliminary discussions he has asked as much as 23¢ an hr. But because Mr. Truman has asked that labor restrict demands to living cost raises it looks like Phil wants a change in pension payments.

Autos Started Fifth Round

Under present contracts he can't ask to have the pension payments changed. But he may try to anyway. The auto union did, and got away with it. In fact the auto union raises granted by all major auto firms have knocked the props out of all other big basic industries.

Mr. Murray will come to the bargaining table after he meets with his executive committee—meeting in Pittsburgh this week—and after he meets with the full wage-policy committee. It meets in Pittsburgh late in October. Then he will be fortified with what is wanted. But by now he has a pretty good idea of what steel is willing to give right off the bat.

The steel corporation would hardly raise prices at this time without consulting the government. Nor would it give a high wage increase and then use that as a crow bar to get a raise in prices.

But some steel people would give a small wage raise—without a price raise—which they consider would take care of the cost-of-living index rise since the last contract was made on wages (1948). That would be in the neighborhood of 5¢ or 6¢ an hr. Murray would probably turn that down but at least he has something to work with.

No steel official in private can blame or censure Mr. Murray for going after a raise considering what happened in Detroit. Steel people are privately burned up at the Detroit wage pattern because it puts so much pressure on them, publicly and otherwise.

No Steel Strike Seen

But the steel wage raise will not come easy. It may be that if the union decides against a small raise unaccompanied by a steel price increase there will be some sharp words and some tough negotiating.

But it is not believed now that there will be a steel strike. Rather it looks like Mr. Murray will do all he can to get the total of 23¢

INDUSTRIAL SHORTS

HUMANITARIAN — The honorary degree of Doctor of Humanities was awarded recently to Charles R. Hook, chairman of the board of ARMCO STEEL CORP., Middletown, Ohio by Muskingum College.

NEW LOCATION—A new expansion program has been announced by the AETNA-STANDARD ENGINEERING CO. Offices and personnel will be transferred from Youngstown to Ellwood City, Pa. during the summer of 1951. Another move is that Aetna's Warren, Ohio plant will build rubber and plastic industry equipment to specifications furnished by Hale & Kullgren, Inc., Akron.

EXPANDS OPERATIONS — A new plant which will specialize in the production of plastic and plastic-metal components for the radio, television and lighting industries is now being constructed for the Parts Div. of SYLVANIA ELECTRIC PRODUCTS INC. at Warren, Pa. The plant is expected to be ready about Oct. 15.

MORE ROOM—Facilities of the Kernersville, N. C. plant of the BORDEN CO.'S Chemical Div. have been expanded recently to include the manufacture of the firm's line of Thor plastic binders and related foundry items.

ACQUIRES PLANT — A steel fabricating plant at Birmingham has been purchased by the BUTLER MFG. CO., Kansas City, from W. L. Coston & Sons. Floyd T. Read will be the Birmingham division acting manager.

U. S. AGENTS—Compania de Acero del Pacifico's new steel mill at Huachipato, Chile, has named PACIFIC INTERNATIONAL CORP., New York, as its purchasing agents in the United States and Canada.

BUYS PISTON DIV. — The Piston Div. of the Deluxe Products Corp., LaPorte, Ind. has been sold to the OHIO PISTON CO., Cleveland. The machinery and equipment of the Piston Div. will be shipped to Cleveland and consolidated with the existing facilities at the Ohio Piston plant.

DOUBLES FACILITIES—Construction of a new main factory and office building to be completed early in 1951 is announced by ECLIPSE FUEL ENGINEERING CO., Rockford, Ill. The new building will increase the manufacturing area by 200 pct.

EASTERN REP — Dynamatic Corp., Kenosha, Wis., manufacturers of adjustable-speed couplings, dynamometers, etc., have appointed WIARD & GREGG, Middletown, Conn. as sales representative for eastern New York, northern New Jersey and western Connecticut.

NO. 39—Two new branch offices, bringing a total of 39 to its domestic offices, have been opened by the FOXBORO CO. One is at 214 W. 10th St., Wilmington, Del. under the managership of Kenneth L. Barton and the other recently opened at 225 S. 5th St., Minneapolis, with Robert C. Cahill as resident engineer.

OPENS AGENCY — Jan R. Dunsford of Pittsburgh and W. Don Logan, formerly with Westinghouse Electric Corp., have opened an agency DUNSFORD & LOGAN in the Caxton Bldg. in Cleveland. They are representing Electro Dynamic motors, Pelham Electric Co. panelboards, and Green Electric Sales Corp. rectifiers.

BETTER SERVICE — New offices in the Stevens Bldg. in Mineola, Long Island have been opened by the Adel Div. of GENERAL METALS CORP.

to include pensions and a wage increase. The steel firms will balk at this because to do that they will have to raise prices.

Why will they have to raise prices? Because their costs have gone up, and they are in the midst of an expansion program that is costing them more than they thought it would; they have to take a lot of this money out of profits.

May Reach White House

So the whole wage trouble in steel may wind up at the White House. But it is safe to say former bitterness between Ben Fairless and Phil Murray has been washed out by the common effort needed to rearm the country and win the Korean war.

Mr. Murray's steelworkers union has a far better record of keeping its pledges than any other large CIO union group. There have been no wildcat pressure strikes in steel. As long as Murray heads it and thinks that he can get some kind of a square deal from steel people he will try to keep that kind of strike to a minimum. But the steel wage pot with all its headaches is boiling this week.

Copper Advisory Committee Formed to Cooperate with NPA

Washington — Industry officials will have a voice in whatever action may be taken by the National Production Authority on the worsening copper supply situation.

At a meeting last week, Commerce Secretary Sawyer and NPA Administrator William H. Harrison and industry representatives decided to set up an industry advistory committee.

Demand Tops Output

Demand for products containing copper has been sustained at high levels since the beginning of 1950. Second quarter consumption was 125,000 tons a month as compared with domestic production of about 75,000 tons.

Industry representatives attending last week's meeting agreed to

serve as a nucleus for the advisory group. Other copper officials will be invited to serve with them. Present at the meeting were:

Simon Strauss, American Smelting & Refining Co.; Robert Dwyer, Anaconda Copper Co., Robert G. Page, Phelps Dodge Corp.; Charles R. Cox, Kennecott Copper Corp.; Norman Hickman, American Metal Company; A. J. McNab, Magma Copper Co., and Newmont Mining Corp.; W. W. Lynch, Calumet & Hecla Consolidated Copper Co.; M. A. Caine, Tennessee Corp., and A. H. Singer, Miami Copper Co.

Moses Leads Coal People To New Harmony

Bituminous Coal Operators Assn. finally formed . . . Harry Moses is Chief . . . Will negotiate labor contracts and promote stability in industry . . . Spent life in coal.

New York—At long last the Bituminous Coal Operators Assn., has been formed, with Harry M. Moses as its chief (THE IRON AGE, June 16, 1949, p. 135). In his capacity as president of the association, representing more than 200 million tons of annual coal production, Mr. Moses will act as coordinator for the industry.

When the new organization is activated Oct. 1, Mr. Moses will resign his present position as president of H. C. Frick Coke Co., a U. S. Steel subsidiary, and devote full time to his new duties. His headquarters will be in the World Center Building, Washington, D. C., as soon as it is completed about Nov. 1.

Aim Is Stability, Harmony

The purpose of the association is to conduct contract negotiations between member companies and the United Mine Workers. Also, to generally promote stable and harmonious relations in the industry.

They couldn't have picked a better man for the job. Harry Moses has been in coal up to his ears all his life. In his early youth he was a member of the United Mine Workers and he has been dealing with them on contract matters since 1926. For the past 13 years he has been president of H. C. Frick Coke Co. and Associated Companies, all subsidiaries of U. S. Steel. He has been a member of the National Bituminous Coal Negotiating Committee since 1943.

Mr. Moses is a lifelong friend of John L. Lewis, despite the fact that they have had their differences across the bargaining table. He is the only man who could logically have been picked for this important job because he has the confidence of all the coal operators as well as Mr. Lewis.

Assisting him will be Joseph G. Chromis who has worked with Mr. Moses as his personal secretary and administrative assistant for 25 years. Mr. Chromis will be secretary-treasurer of the association. Directors will consist of chief executives of the member companies.

"The fourth test is the most crucial, Mr. Sandstrom."

Aluminum Leaders Ask NPA To Halt Aluminum Stockpile Buying

Washington—The aluminum industry last week asked the new National Production Authority to use its influence to halt stockpile purchases of aluminum. The three producers represented at the meeting also asked NPA to assure them adequate electric power. Indications were that this matter would be taken up with the Interior Dept., the controlling agency for fuels and energy. The aluminum industry also indicated that it did not think allocation controls were necessary at this time, and promised full cooperation in getting needed military supplies. In attendance at the meeting were: D. Wilmot and Robert Learnard, Alcoa; R. S. Reynolds, Reynolds Metal Co.; D. A. Rhodes and Chad F. Calhoun, Kaiser, Inc.

A formal industry-wide committee will be set up at an early date.

Worthington Gets Italian Orders

Harrison, N. J.—Italian orders for over $1 million in steam power plant equipment have been received by Worthington Pump & Machinery Corp. recently.

Severe droughts in Italy, where power is supplied almost entirely by hydro-electric plants, has made necessary the steam power expansion. The program is financed by ECA.

Detroit Plant to Be Enlarged

Conshohocken, Pa.—Quaker Chemical Products Corp. has issued contracts to increase its Detroit plant and storage facilities by 50 pct, according to L. O. Benoliel, vice-president.

New Casting Company Formed

New York—Precision casting operations of Vicon Casting Corp. will be handled by a new organization, Omni-Metal Castings, Inc. Vicon will continue to handle precious metal work.

Reserve Taconite Interests Acquired by Republic and Armco

Valuable Mesabi Range deposits greatest future ore source.

Cleveland—The magnetic taconite program, currently considered to be the largest future source of iron ore in the United States, shifted into high gear this week as Republic Steel Corp., and Armco Steel Corp. announced joint acquisition in equal shares 100 pct ownership of the stock of Reserve Mining Co.

Reserve Mining Co. controls a large deposit of magnetic taconite iron ore located at the eastern end of the Mesabi Range in Saint Louis county, Minn. Present plans, according to the announcement, call for an ultimate expenditure of $160 million.

Commercially Practical

The commercial practicability of this type of ore has been demonstrated in trial production runs in a blast furnace of Armco Steel Corp. The cost of pig iron produced from this material compares very favorably with the cost of iron made from natural ores of the same content.

The property under lease by Reserve Mining Co. includes about 17,000 acres and the ore body is approximately nine miles long. It is known to contain at least 1½ billion tons of magnetic taconite which can be mined by the open pit method. This, when converted, will amount to about ½ billion tons of high grade iron ore, enough to supply 10 million tons of ore annually for 50 years.

Additional Taconite Tonnages

In addition to the proved deposits, geological studies indicate the presence of substantial additional tonnages of taconite.

Reserve Mining Co. contemplates building a plant to process the taconite ore near Beaver Bay on the north shore of Lake Superior. The first unit of the plant to be built as soon as plans can be completed will produce about 2½ million tons of iron ore pellets annually and will represent an investment of more than $60 million.

To transport the taconite rock from the mines a 47-mile railroad will be constructed to Beaver Bay.

To provide for loading facilities for lake ore carriers, a dock and harbor will be built. The breakwater for the harbor will connect with two off-shore islands.

Longer range development plans provide for future expansion of the plant to provide an annual capacity of 10 million tons at an estimated additional cost of $100 million.

Armco Steel Corp. previously held a one-third interest in Reserve Mining Co., Wheeling Steel Corp. held a third and the remainder was held by Cleveland Cliffs Iron Co. and Montreal Mining Co.

Republic Steel Corp. has acquired the interests of Cleveland Cliffs and Montreal Mining, and half of the interest of Wheeling Steel.

Armco has purchased the other half of the Wheeling Steel holding, giving each company a 50 pct interest. Oglebay-Norton & Co. will manage the property.

Fairless Gives PA's State of Steel Message

Analyzes reasons for steel shortage . . . Triples Johnson's guess on steel needs for defense . . . Says industry must meet expansion challenge and plans huge building project.

Philadelphia — Purchasing agents who expected to hear plain talk from Ben Fairless, president of U. S. Steel, here, last week did not go away disappointed. They got it straight from the shoulder. In a totally frank manner Mr. Fairless gave them his views of the steel situation, letting the chips fall where they may.

Gives Shortage Reasons

Admitting that there is a steel shortage today, Mr. Fairless blamed telescoping of consumer demand, replenishment of inventories, and a run on steel caused by advance notice of allocation to come. He also reminded the purchasing agents that they had lost 29 million tons of steel production since the last war because of strikes. But he did not point the finger of blame at the steelworkers, admitting that both could be at fault and that as an interested party he is "not qualified to judge."

Military demand for steel may rise as high as 12 million tons a year by next July (this is three times the figure mentioned recently by ex-Secretary of Defense Johnson). This would be equal to one-eighth of total annual steel production. "But unfortunately," he said, "it isn't as simple as that.

"I don't have to tell you that our greatest difficulty today lies in the field of light, flat-rolled products, and it is right here in this field—where we were already struggling to keep our heads above water—that much of the military demand is going to fall.

"The armed forces will need landing craft, tanks, more trucks and jeeps, blitz cans, field ranges, aircraft landing mats, lockers, tin cans, and a lot of other things that will take large quantities of flat-rolled steel. Beyond that we are going to have to build more oil pipe lines, more freight cars and more grain storage bins. And when they get through, our supply of flat-rolled products is going to look mighty flat indeed."

Obligation to Expand

He said, "It is up to industry to build—as rapidly as it can—the capacity required to meet our defense needs with the least possible disturbance to our necessary civilian demands. To meet this challenge, he said, the steel industry is now compressing into the space of a few months a construction program that normally would have been spread over many years.

"U. S. Steel's eastern mill (The Fairless Works) which is to be

built near Trenton, N. J., will make the type of products (flat-rolled) and be "large enough to produce whatever steel our government may want us to produce in this area."

He said that "we do not seem to be facing any insurmountable problems so far as raw materials and other essential ingredients of steel are concerned. Of the alloys, nickel alone is really scarce . . . may cause us to change steel specifications later on. Government stockpiles of zinc, tin, chrome, copper and manganese will insure against any critical shortage of these metals in the immediate future, but the long-range outlook on manganese is still thin."

Cold Steel Flows into Shape for War Shells

U. S. takes German process . . . Promises large steel savings and machining time . . . Mullins installs Lake Erie extrusion press . . . Will try for large saving in steel scrap.

New York—Taken as war spoils from defeated Germany by an American Technical Industrial Intelligence Committee, a revolutionary process for the cold extrusion of steel into shapes for artillery and other shells will help the U. S. in present or future wars. Cold extrusion of steel effects large savings of steel and labor. The German secrets of a process previously not considered feasible were special dies to withstand terrific flow stresses and special die lubricants.

Steel Under Pressure

This process of making cold steel "flow" into a die under the irresistible urging of a hydraulic or mechanical press is now being utilized to produce shells that are filling the breeches of U. S. guns. Cold extrusion saves up to 40 pct on steel and pares machining time to an incredible minimum.

Now in operation at the Mullins Mfg. Corp., Warren, Ohio, is a mammoth 56-ft high Lake Erie Hydraulicpress that can slam 100 tons per sq in. pressure on a steel billet to make it plastic. The cold deformation imparts a hardness to low carbon steel that reduces the need for alloying elements and heat treating (THE IRON AGE, Aug. 4, 1949, p. 90).

Although cold extrusion of softer nonferrous metals was practiced in this country before the war, Germany, out of World War II desperation, was the first to try the method on steel. German warlords found the usual way of making shells—forging or casting and machining—too wasteful in steel and manhours. They ordered industry to find a more economical way and cold extrusion was the result.

Built for Extrusion

It is a sign of the times that cold extrusion has been relegated to a prime function of turning out casings for explosives, but it is pointed out that the process has many industrial facets. The Lake Erie Engineering Co. says manufacturers with products that are thick-walled steel cups or hollow cylinders with fairly high physcals might profit by the process.

At first it was believed that a mechanical press would be superior to the hydraulic as cold extrusion power, but now Robert E. Dillon, Lake Erie president, reports that the Hydraulicpress installed at Mullins "is the first press specifically designed in this country for steel extrusion."

Mullins will use its new press to produce a pilot lot of projectiles for the 105MM howitzer and anti-aircraft projectiles for the Navy. The firm hopes to show that steel scrap from the production of 100 million 105MM shells will be cut down from a million tons for the World War II forging operation to 40,000 tons with extrusion. Greater accuracy of shells is also anticipated.

Promise of possible savings in steel for armaments production should mean more steel for other production.

New Firm Buys Toronto Plant

Pittsburgh—A new company, chartered as Ohio River Steel Corp., has acquired from Kovalchik Industries, Inc., the Toronto, Ohio, steel plant formerly owned by Follansbee Steel Co. Samuel Magid, chairman of Penn-Ohio Steel Co., declined to disclose the principals. Penn-Ohio is not one of them, he said.

It was reported that Whitney-Apollo Steel Co. interests were involved. The plant was sold to Kovalchik, of Indiana, Pa., by Follansbee about a year ago. Magid said the plant would be pouring steel within 60 days from one of four openhearth furnaces, but that three others will require rebuilding. New sheet finishing facilities will be installed, he said.

Complete $5 Million Staley Plant

Decatur, Ill.—Completion of a $5 million solvent extraction unit has given the A. E. Staley Mfg. Co. the greatest soybean processing capacity in the world. General contractor on the new plant was the H. K. Ferguson Co. of Cleveland. Major equipment was supplied by the Blaw-Knox Co.

ICC Freight Operating Order Became Effective on Sept. 20

Washington — The Interstate Commerce Commission has postponed until Sept. 20 the effective date of a previous order designed to speed rail freight movements by raising demurrage rates and tightening operating rules.

New demurrage charges are: $5 per day for the first and second days after expiration of free time, $10 a day for the third and fourth, and $20 a day thereafter. Previous charges were $3 a day for the first four and $6 a day thereafter.

Exempted from the order is bulk freight held at ports, including Great Lakes, for transfer to vessels. The order also restricts relief afforded under the so-called "average agreement."

Railroads are required to promptly notify shippers of empty car arrivals and to remove empty or loaded cars within 24 hours. They are prohibited from holding cars for future loading, except for seasonal or peak movements, in excess of an industry's current or normal needs.

Lake Ore Carriers Report Record-Breaking August Tonnage

Cleveland — Movement of iron ore in August totaled 12,482,069 gross tons, eclipsing any August movement since 1943, the Lake Carriers' Assn. reported here.

The 12,482,069 gross tons carried brought the season's movement up to 46,768,863 gross tons, as of Sept. 1, which is 10,499,353 tons below 1949 and 7,800,864 tons short of the same period in '48.

Lake shipping men believe that this statistical gap created by the late opening of navigation should be largely erased during the fall. Ships were idled a year ago by work stoppages at mills and mines.

To date, the coal movement is substantially ahead of 1949—31,349,435 tons compared with 26,901,583 net tons on Sept. 1, 1949. Total movement of ore, coal and grain for the month amounted to 22,198,316 net tons, exceeding total movement for the same month last year by nearly 3 million tons. For the season to date, ore, coal and grain lag behind 1949 by a little over 9 million tons.

Reliance Acquires Canadian Plant, Will Expand Its Facilities

Cleveland—A controlling interest in Commonwealth Electric Co., Ltd., of Welland, Ont., has been acquired by Reliance Electric & Engineering Co., J. W. Corey, Reliance president has announced.

Manufacture of transformers and electric motors will be continued in the Welland plant where currently about 200 men are employed. Reliance, which has motor and accessory manufacturing plants in Cleveland and Ashtabula, Ohio, plans to expand the Canadian facilities.

STEEL PRODUCTION (Ingots and Steel for Castings)

As Reported to the American Iron & Steel Institute

Period	OPEN HEARTH		BESSEMER		ELECTRIC		TOTAL		Calculated Weekly Production (Net Tons)	Number of Weeks in Month
	Net Tons	Percent of Capacity	Net Tons	Percent of Capacity	Net Tons	Percent of Capacity	Net Tons	Percent of Capacity		
January 1950	7,131,519	96.5	379,252	80.6	419,601	71.9	7,930,372	93.9	1,790,152	4.43
February	6,142,178	92.0	255,565	60.2	395,502	75.0	6,793,245	89.1	1,698,311	4.00
March	6,747,680	91.3	265,726	56.5	473,630	81.1	7,487,036	88.7	1,690,076	4.43
1st Quarter	20,021,377	93.3	900,543	65.9	1,288,733	76.0	22,210,653	90.6	1,727,111	12.86
April	7,314,733	102.2	407,909	89.5	490,030	86.7	8,212,672	100.4	1,914,376	4.29
May	7,597,837	102.8	437,006	92.9	517,044	88.6	8,551,887	101.3	1,930,449	4.43
June	7,2 8,570	100.9	406,944	89.3	506,001	89.5	8,131,515	99.4	1,895,458	4.29
2nd Quarter	22,131,140	102.0	1,251,859	90.6	1,513,075	88.2	24,898,074	100.4	1,913,611	13.01
1st 6 months	42,152,517	97.7	2,152,402	78.3	2,801,808	82.2	47,108,727	95.5	1,820,902	25.87
*July	7,220,214	96.9	380,317	79.8	470,763	78.4	8,071,294	94.7	1,826,085	4.42
†August	7,295,936	97.7	405,118	84.8	493,527	82.0	8,194,581	95.9	1,849,793	4.43
September										4.28

Note—The percentages, of capacity operated in the first 6 months are calculated on weekly capacities of 1,668,287 net tons open hearth, 106,195 net tons Bessemer and 131,786 net tons electric ingots, and steel for castings, total 1,906,268 net tons; based on annual capacities as of January 1, 1950 as follows: Open hearth 86,984,490 net tons, Bessemer 5,537,000 net tons, Electric 6,871,310 net tons, total 99,392,800 net tons. Beginning July 1, 1950, the percentages of capacity operated are calculated on weekly capacities of 1,685,059 net tons open hearth, 107,806 net tons Bessemer and 135,856 net tons electric ingots and steel for castings, total 1,928,721 net tons; based on annual capacities as of July 1, 1950 as follows: Open hearth 87,858,990 net tons, Bessemer 5,621,000 net tons, Electric 7,083,510 net tons, total 100,563,500 net tons.

* Revised.

† Preliminary figures, subject to revision.

January 1949	7,289,865	101.2	406,552	92.6	498,973	96.1	8,197,390	100.4	1,850,427	4.43
February	6,635,765	102.0	379,698	95.3	478,479	102.0	7,493,942	101.6	1,873,485	4.00
March	7,476,139	103.7	430,176	97.5	495,481	95.4	8,401,796	102.9	1,896,568	4.43
1st Quarter	21,401,769	102.3	1,218,426	95.2	1,472,933	97.7	24,093,128	101.6	1,873,494	12.86
April	7,017,712	100.6	404,095	94.6	374,358	74.4	7,796,165	98.6	1,817,288	4.29
May	6,891,293	95.6	400,741	90.9	306,956	59.1	7,598,990	93.0	1,715,348	4.43
June	5,956,402	85.4	349,196	81.8	199,058	39.6	6,504,656	82.2	1,516,237	4.29
2nd Quarter	19,865,407	93.9	1,154,032	89.1	880,372	57.7	21,899,811	91.3	1,683,306	13.01
1st 6 months	41,267,176	98.1	2,372,458	92.1	2,353,305	77.6	45,992,939	96.4	1,777,848	25.87
July	5,309,060	73.8	300,236	68.2	175,535	33.9	5,784,831	71.0	1,308,785	4.42
August	6,103,326	84.7	355,335	80.6	264,110	50.9	6,722,771	82.3	1,517,556	4.43
September	5,994,100	86.1	350,282	82.2	253,553	50.5	6,597,935	83.6	1,541,574	4.28
3rd Quarter	17,406,486	81.5	1,005,853	76.9	693,198	45.0	19,105,537	78.9	1,455,106	13.13
9 months	58,673,662	92.5	3,378,311	87.0	3,046,503	66.6	65,098,476	90.5	1,669,192	39.00
October	814,618	11.3			113,729	21.9	928,347	11.4	209,559	4.43
November	3,806,870	54.6	172,270	40.3	243,989	48.5	4,223,129	53.4	984,412	4.29
December	6,953,653	96.7	396,075	90.0	378,496	73.0	7,728,224	94.8	1,748,467	4.42
4th Quarter	11,575,141	54.2	568,345	43.4	736,214	47.8	12,879,700	53.2	980,190	13.14
2nd 6 months	28,981,627	67.8	1,574,198	60.2	1,429,412	46.4	31,985,237	66.0	1,217,558	26.27
Total	70,248,803	82.8	3,946,656	76.0	3,782,717	61.9	77,978,176	81.1	1,495,554	52.14

Note—The percentages of capacity operated are calculated on weekly capacities,of 1,626,717 net tons open hearth, 99,559 net tons Bessemer and 117,240 net tons electric ingots and steel for castings, total 1,843,516 net tons; based on annual capacities as of January 1, 1949 as follows: Open hearth 84,817,040 net tons, Bessemer 5,191,000 net tons, Electric 6,112,890 net tons, total 96,120,930 net tons.

NPA Allocation Starts at Slow Motion Pace

Commerce Dept. man hints that NPA awaits prodding to start . . . Also says that industry expects more than is contemplated now . . . Coming controls listed—*By Gene Hardy.*

Washington — The allocation program of the National Production Authority is making haste slowly. As one old-line official of the Commerce Dept. said to THE IRON AGE, "They are acting as though they don't want to start it, but want to be forced into it."

This official also indicated that the industry executives contacting the Commerce Dept. seem to expect a lot more to be done than is actually contemplated now.

Beyond the inventory control order already issued, here are the other production control actions which can be anticipated, according to W. Stuart Symington, NSRB coordinator of the program:

(1) A rated order system establishing priorities for defense orders.

(2) Material conservation orders for materials critically needed for the defense program, accompanied where necessary by orders limiting production of particular end products.

(3) Production programs developed with industry task groups to provide for the needs of the defense program and to protect the industry and the normal customers from unnecessary dislocation.

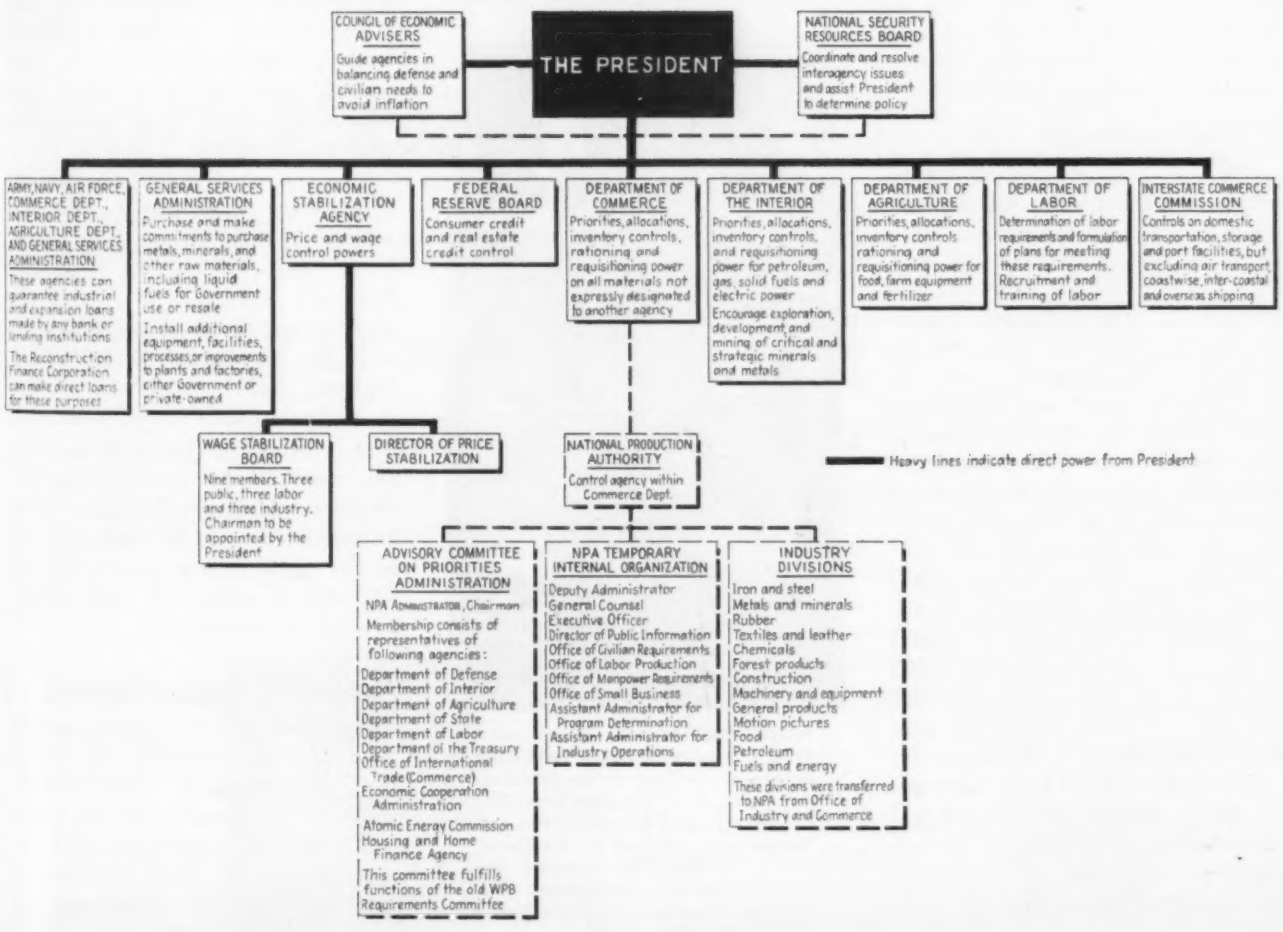
(4) Reports from industry to develop the necessary information for the establishment of a priority and allocation policy—data such as consumption of material, volume of rated orders.

(5) Special expediting to assist defense production.

(6) Setting up of appeals machinery for hearing appeals on grounds of undue hardship or administrative discrimination.

NPA is also planning to enlarge its Bureau of Industry operations by adding new industry and commodity divisions in addition to those already transferred from the office of industry and commerce (see flow chart below). The new divisions already in the works cover the following items—tin, lead and zinc, copper, light metals, electronics, building materials, transportation equipment, and containers.

Delegation of Authority Under Defense Production Act



Defense Program Fear Starts Aluminum Rush

Consumers scramble for metal while major producers wonder what the hubbub's about . . . They see nothing to fear for a while . . . Capacity and operation enlarged—*By John Delaney.*

Pittsburgh—The Korean crisis has injected a note of hysteria into the scramble for aluminum. Consumers with unhappy memories of the World War II famine for civilian applications are fearful of what an expanded defense program will do to them, and are acting accordingly.

Almost obscured by the frantic rush to get on order books, however, are these facts: (1) The industry is turning out aluminum at a record pace for peacetime, (2) capacity is more than four times what it was in the peak prewar year 1939, will reach a theoretical capacity in excess of the wartime production peak within the next year, and (3) defense requirements thus far indicated call for diversion of only 14 pct of the industry's present capacity to military applications.

Heading for Record

On the basis of reliable estimates, aluminum producers are headed for a postwar production record of 1,350,000,000 lb this year. Production through July was 810 million lb. The industry's capacity as of June was 1,500,000,000 lb, and within the next year is expected to reach approximately 1,850,000,000 lb. Peak production year during World War II was 1943 when the industry turned out 1,840,000,000 lb. In 1939, industry's capacity was 350 million lb.

In addition to American capacity, Canada now has the facilities to produce an estimated 1 billion lb per year, as compared with 200 million lb at the start of World War II. Actual Canadian production in 1949 was 738 million lb.

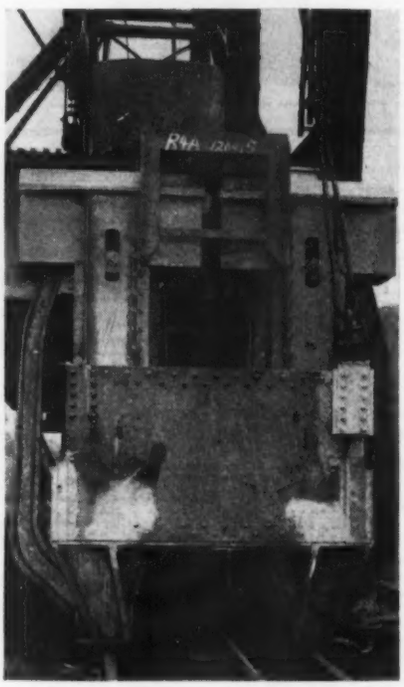
This adds up to a total capacity for the U. S. and Canada of approximately 2,850,000,000 lb already in existence or scheduled for reactivation during the next year.

War-scare buying, coupled with strong demand before the Korean trouble has forced Aluminum Co. of America, Kaiser Aluminum, and Reynolds Metals to allocate pig and ingot aluminum and fabricated products to their regular customers.

Why the Furore?

But harried aluminum producers are wondering what all the shouting is about. They admit that an expanded defense program is going to mean less metal for civilian use, and that the situation is likely to get worse before it gets better. They point out, however, that the real pinch is not likely to come soon, if at all, and that a lot depends on international developments—an "iffy" matter at the moment. While a big plane building program will require much heavier tonnages than are now being consumed for this purpose, it will take some time to build up to the peak reached during World War II.

In testimony before the Senate Appropriations Committee last July, former Defense Secretary Louis Johnson estimated that the $25 billion military expansion program then contemplated would require 200 million lb of aluminum, or 14 pct of U. S. capacity, for the fiscal year ending June 30, 1951. However, industry people believe that this estimate is low, that actual requirements might take 20 pct of American production.



WIND FRUSTRATERS: Winds were practising swing and sway techniques on two ore bridges at the Midland, Pa., plant of the Crucible Steel Co. of America until these powerful rail clamps were installed by the Dravo Corp. Automatically actuated by an anemometer arrangement, the grippers hold the bridges stationary while brisk winds whistle by.

Dredging of Orinoco River Approved by Venezuelan Junta

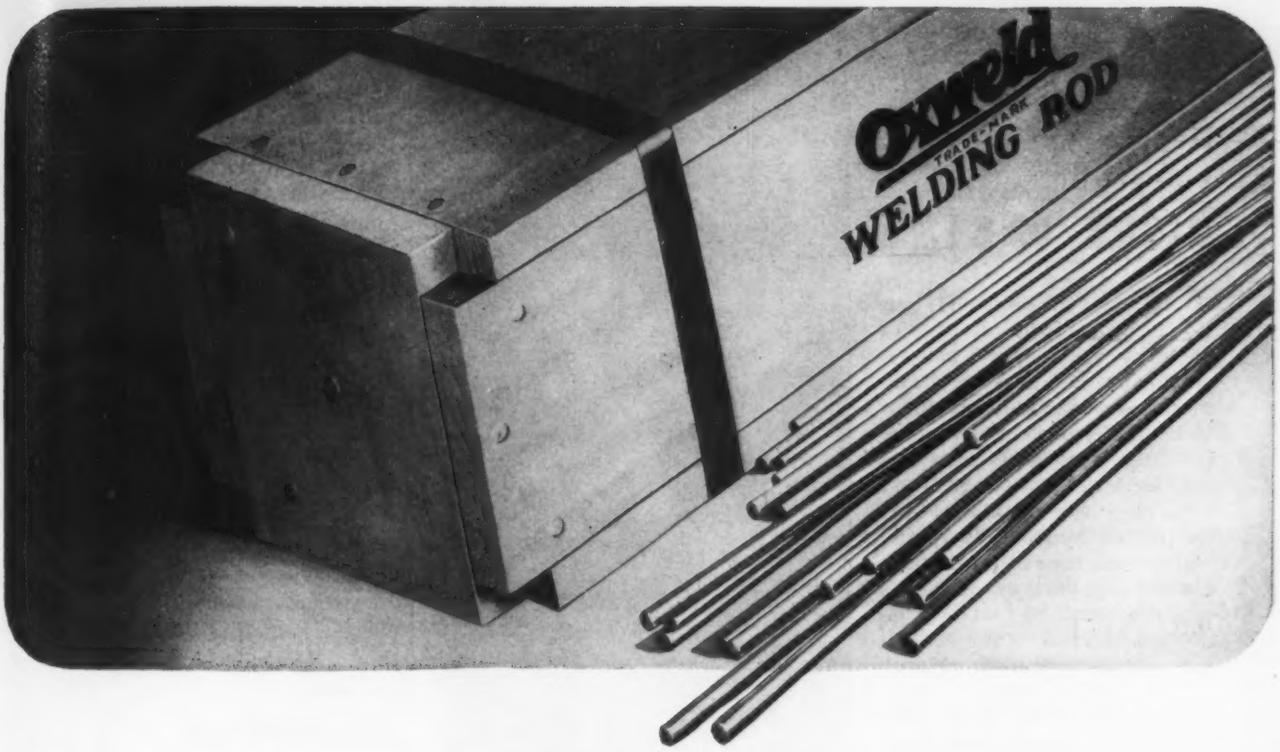
Caracas—Orinoco Mining Co. is making engineering studies preparatory to dredging the Orinoco River from its junction with the Caroni River to the Atlantic Ocean. Official approval of the project was obtained from the Military Junta of Venezuela several weeks ago.

Thus the Orinoco will eventually serve as a broad highway down which will pass the ore traffic from Cerro Bolivar, U. S. Steel's fabulous mountain of ore. A 90-mile railroad will be built to connect the ore lode with its broad highway. Total cost of the project is estimated at $120 million.

It is expected that a 26 to 28-ft channel will be dredged in the Orinoco, although this may later be deepened to 31 ft. Actual work on the project, to begin within the next few months, will take about 4 years to complete.

Pennsalt 100 Years in Business

Philadelphia—Pennsylvania Salt Mfg. Co. will celebrate its 100th anniversary Sept. 25 with a week-long series of events at the company's Whitemarsh Research Laboratories here. The opening luncheon will be addressed by Gov. James H. Duff.



How "OXWELD" Rods Reduce Welding Costs

Trade-Mark

You use less rod per weld, because OXWELD Rods produce high-strength welds with minimum reinforcement. OXWELD No. 1 H. T. Rod, for example, has a tensile strength 11,000 lb. per sq. in. higher than any ordinary steel rod—enough *extra strength* to permit reduction of the amount of weld metal on a job, with substantial saving of gases and labor.

You weld easier and faster—saving both time and gases—because all formulas for OXWELD Rods are worked out to give highest weldability as well as best possible physical properties in finished welds.

You get better welds at lower finishing costs, because welds made with OXWELD Rods are always of uniform high quality, strength, and ductility—easy to machine and finish without excessive labor.

You need fewer types of rods to handle your complete range of welding. Five OXWELD Rods—No. 1 H. T. Steel, No. 7 Drawn Iron, No. 25M Bronze, No. 23 Aluminum, and No. 9 Cast Iron—are sufficient for all average fusion welding, braze-welding, and bronze-surfacing. For the less frequent jobs of specialized nature, there are 9 additional welding rods and 8 hard-facing rods—all available from the same source.

The term "Oxweld" is a registered trade-mark of Union Carbide and Carbon Corporation.

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Harrison Issues NPA Order Holding Inventories to Minimum

Washington — Inventories of numerous steel and metal items, including scrap, must be held to a "practicable working minimum" under NPA Reg. 1 issued by the National Production Authority, effective Sept. 18.

Also included under the inventory control order are numerous chemical, rubber, building and textile items, and forest products.

The order applies to all buyers and sellers for either production or resale purposes, including resale for exports. Exempted are purchasers for home or personal consumption. National stockpiling is not involved.

Imports Unlimited

Importers may buy unlimited quantities from foreign sources, but may not place domestic orders for the period such imports raise inventories above normal. In the case of materials historically produced or marketed in minimum quantities, orders may continue to be placed even though delivery increases inventories above permitted levels temporarily.

Outstanding orders should be promptly cancelled, reduced or deferred if delivery on schedule would result in excess inventory. The same requirement applies if schedules are adjusted, if production is slowed, stopped, or changed.

A business which historically stocks up in advance for seasonal reasons may continue to do so if "deliveries accepted are no greater and no further in advance" than normal.

Administrator William H. Harrison pointed out that the supplier is prohibited from shipping or making deliveries if he "knows or has reason to believe" the customer is not entitled to receive them.

All materials, whether held directly or by others in account for a business or industry, must be figured in inventory.

While Reg. 1 does not provide for disposal of excess inventories, such excess stocks are subject to requisi-

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COPPER ALLOY BULLETIN

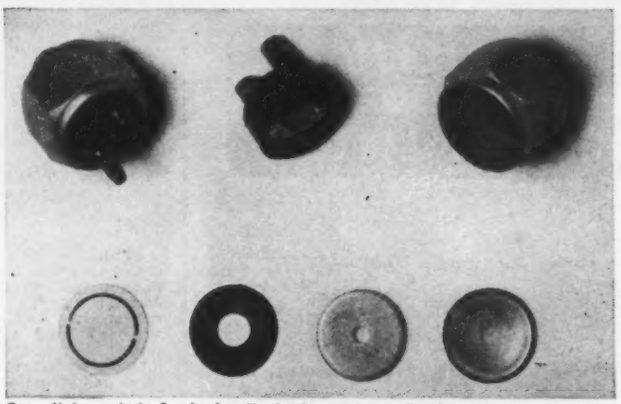
REPORTING NEWS AND TECHNICAL DEVELOPMENTS OF COPPER AND COPPER-BASE ALLOYS

Prepared Each Month by BRIDGEPORT BRASS COMPANY "Bridgeport" Headquarters for BRASS, BRONZE and COPPER

Phosphor Bronze Vital to Switch

Stop light switches for cars with hydraulic brake systems use phosphor bronze and free turning brass for both electrical and mechanical applications.

This unit is expected to operate for a considerable period of time without attention or maintenance.



Stop light switch for hydraulic brake system, showing component parts. Courtesy Fasco Industries Incorporated, Rochester, N. Y.

When brake pressure is applied, oil is forced against a composition rubber diaphragm, applying pressure to a phosphor bronze diaphragm which in turn closes a phosphor bronze switch leaf, making electrical contact. When the brake is released, the bronze diaphragm acts as a cricket, snapping back to open the switch by combatting the residual pressure of the hydraulic system.

Due to the countless making and breaking of contact of the switch in the normal use of a car, spring temper phosphor bronze was selected because of its exceptional resistance to fatigue.

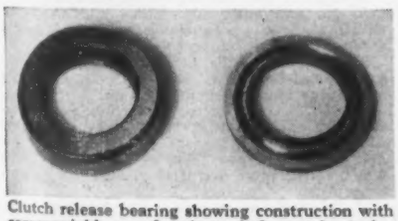
Free cutting brass rod is used for the terminal pins because of its machinability and ability to withstand corrosion from moisture and petroleum oils.

Bronze Ferrule Increases Life of Clutch Bearing

Commercial bronze ferrules are used in the illustrated clutch release bearing to prevent leakage of grease and entrance of dirt into the bearing.

Although the ferrule has no part in the function of the bearing, it may be subject to some wear if it comes in contact with the carrier sleeve after the clutch fingers release the clutch pressure from the bearing.

Commercial bronze (90% copper, 10% zinc) was selected because it has greater wear resistance and is stronger than copper, yet approaches it in workability.



Clutch release bearing showing construction with commercial bronze ferrule made from strip stock—Courtesy Bearings Co. of America, Lancaster, Pa.

The strip bronze is cut to length, then the metal is flanged. Since high copper alloys do not work harden as rapidly as the lower ones such as high brass, stresses are where the metal is doubled back on itself.

The pre-lubricated bearing is an important change in clutch bearing design. Often this point of lubrication was omitted, thereby reducing the bearing life. Several hundred thousand operations are expected of this bearing, which represents many years of life. Not only is relubrication unnecessary, but one fitting is eliminated in the construction.

Copper Wire, Tube, Sheet Used in Electric Motor

Copper wire, sheet and tube as well as free machining brass rod are an integral part of the illustrated 110-volt, 60-cycle induction motor.

Enameled copper wire is used for the windings of the stator which set up the magnetic fields. As a means of concentrating the magnetic flux in these fields, extruded and drawn rectangular copper tube is cut into sections. Two pieces are inserted opposite each other in the laminations as shading bands.

In the rotor, two blanked and pierced copper washers are used as shorting rings. Cold-headed copper pins are inserted through these discs and laminations and both ends are copper welded.

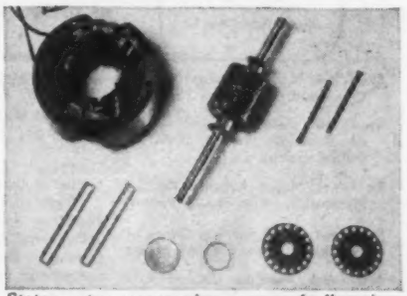
Two free machining brass bushings are used as spacing elements between the rotor ends and the bearings.

Three main types of copper are commercially available:

Electrolytic tough pitch is used for bus bars, conductivity wire, switches, terminals, contacts, etc. It contains a small quantity of copper oxide and its conductivity is set at 101%.

Deoxidized copper has a conductivity of 85% and is used for various tube applications. In the sheet form, it is suitable for operations where extra deep draws and flanging are required.

Oxygen-free copper has an exceptionally high ductility and the highest electrical conductivity of the three types mentioned. Where a high degree of electrical efficiency is necessary, this metal is normally utilized.



Stator, rotor, copper pins, copper shading rings and shorting discs in induction motor—Courtesy Fasco Industries Incorporated, Rochester, N. Y.

• News of Industry •

Continued from Page 114

tion under the Defense Production Act.

Delivery may be made and accepted in inventory excess (after stock adjustment of inventory) of "special items . . . special components or special materials." Special items are defined by the order as those the supplier "does not usually make, stock, or sell, and which cannot be readily disposed of to others."

The initial list of items on which the working inventory restriction order applies includes the following:

STEEL. Ingots and semi-finished, including skelp; castings, rough and semi-finished; structural shapes and piling; plate; rails and track accessories; wheels and axles; bars, including reinforcing; standard pipe and tubing; wire, wire rods and wire products; hot and cold rolled sheet and strip; tin, terne, and black plate; galvanized sheet and strip; electrical sheet and strip; other mill shapes and forms; rough forgings; and scrap. The order applies alike to carbon and alloy, including stainless.

IRON. Pig iron, gray iron and malleable iron castings, rough and semi-finished; and scrap.

ALUMINUM. Crude primary and secondary; semi-fabricated (including die)—sheet, strip and plate; rolled structural shapes such as rod, bar and wire; extruded shapes; tube blooms and tubing; powder, flake and paste; and aluminum and aluminum-base scrap containing commercially recoverable metal.

COPPER. Fire and electrolytic refined; secondary and copper base alloys; alloy plate, sheet and strip; alloy rod, bar and wire; alloy tube and pipe; unalloyed rod, bar and wire; copper wire and wire products; copper and copper base castings; and copper and copper base scrap containing recoverable metal.

TIN. Primary and secondary; all tin and tin base alloy scrap containing commercially recoverable metal.

NICKEL. Alloyed and unalloyed; imported matte; bars, rods, tubes, sheet bar, ingot, blooms, billets, sheet strip; and scrap containing recoverable nickel.

ZINC. Slab in all grades; base alloy in crude form; dust and oxide; zinc and zinc-base scrap containing recoverable metal.

TUNGSTEN. In any form or shape, except finished forms fabricated for installation into electrical communication systems, incandescent lamps, and electronic equipment; ferro metal powder and any other ferrous combination of tungsten exclusive of alloy steel, high speed steel, and tool steel; nonferrous or alloy mixtures requiring further processing whether the same or by melting, welding, brazing, etc., but not limited to mixtures and alloys for tools, blanks or hard facing materials; compounds containing tungsten as a recognizable element; and, of course, recoverable scrap.

MANGANESE. Metal, ferromanganese, spiegeleisen, and other compounds and alloys in which it is a recognizable component; and scrap containing recoverable manganese.

MAGNESIUM. Primary and secondary ingots; semi-fabricated shapes; and all scrap containing recoverable magnesium.

COLUMBIUM. Ferro, potassium columbium chloride, oxide and carbide; and recoverable scrap.

COBALT. In any form and combination in which cobalt is an essential constituent, except, concentrates, cemented carbide tipped tools, cast cobalt-chrome-tungsten-molybdenum tools, alloy hard facing welding rods, paints, varnishes, lacquers and similar products; and scrap materials from which cobalt may be recovered.

CHEMICALS. Industrial alcohol, benzene, caustic soda, chlorine, glycerine, and all grades of soda ash.

RUBBER. Dry and latex; and synthetic, including latices, GRs, butyl, neoprene, and N-types.

MISCELLANEOUS. Portland cement; gypsum board; softwood and hardwood, (rough-sawed, dressed, or worked to a pattern) including crating but not including railroad and mine ties; Hessian burlap; high tenacity rayon yarn; and nylon staple and filament yarn.

Waiting for you to set them in motion

. . . Ready to give you something *above* the ordinary in service on tool, alloy, or stainless steel. Look how they can help you:

There's the man on the order desk in your nearby Carpenter MILL-BRANCH WAREHOUSE. He's waiting to give you quick information on prices, sizes, and grades. There's the representative ready to help you with tooling and production problems. There's the crew of delivery men backed by time-saving equipment to get out emergency orders.

And there's more. For *every* man in your nearby Carpenter MILL-BRANCH WAREHOUSE, there are *hundreds more* in the Reading Mill waiting to work for you. That's the difference. For Carpenter's warehouses are MILL-BRANCH WAREHOUSES. Every time you call you have a direct line on Mill Laboratory and Metallurgical Help, Mill Quality and Uniformity—*comprehensive* Mill Service.

You'll find it's the *closest* thing to having a *specialty* steel Mill right in your own back yard!

Here's what *you* want in steel service. To discover how easy it is to get it, call Carpenter. Simply pick up your phone and call your nearest Carpenter MILL-BRANCH WAREHOUSE or Distributor. The Carpenter Steel Co., 121 W. Bern St., Reading, Pa.

SPECIALTY TOOL • ALLOY • AND • STAINLESS STEELS

STEEL CONSTRUCTION NEWS

Fabricated steel awards this week included the following:

2600 Tons, Landover, Md., District Center, to Bethlehem Steel Co., Bethlehem, Pa.

750 Tons, Philadelphia, Market St. subway, 42nd St. to 46th St. extension, to Bethlehem Steel Co., Bethlehem, Pa.

600 Tons, Indiana County, Pa., bridge, Pennsylvania Dept. of Highways, A. E. O'Block, contractor, low bidder.

525 Tons, Norristown, Pa., State Hospital Building No. 12, to Lehigh Structural Steel Co., Allentown, Pa.

410 Tons, Linwood Shopping Center, Fort Lee, New Jersey, to Grand Iron Works.

350 Tons, Scranton, Pa., Mary Wood College, McCloskey & Co., contractors, low bidder.

290 Tons, New Orleans, La., for Chalmette Sugar Refining Company, warehouse, to Virginia Bridge Company, Birmingham.

287 Tons, Charlestown (Boston), Mass., additions to Rutherford Ave. plant of Hood Milk Co., through William M. Bailey Co., to A. O. Wilson Structural Steel Co., Cambridge, Mass.

250 Tons, State College, Pa., mechanical engineering building, Penna. State College, Henry A. Baton, Philadelphia, low bidding contractor.

175 Tons, Wilmington, Del., building for the New Journal Co., to Bethlehem Fabricators, Inc.

125 Tons, Brookline, Mass., refuse incinerator for town of Brookline, through Bossi Construction Co., Roxbury, Mass., to West End Iron Works, Cambridge, Mass.

Fabricated steel inquiries this week included the following:

1000 Tons, Jersey City, N. J., bridge for New York, Susquehanna & Western Railroad Co., due Sept. 28.

800 Tons, Philadelphia, four-building expansion by Gulf Oil Co., Pittsburgh, bids due.

650 Tons, Berks County, Pa., bridge for Pennsylvania Dept. of Highways, due Sept. 29.

250 Tons, Dixmont, Pa., Dixmont State Hospital Admissions Bldg., General State Authority, due Sept. 27.

228 Tons, Glastonbury, Conn., three rolled beam bridges and approaches, E. B. Budrick, Hartford, Conn., district engineer.

Reinforcing bar awards this week included the following:

2640 Tons, Los Angeles, Calif., Tujunga Wash Improvement, through Bressi-Bevanda, No. Hollywood, Calif., to Blue Diamond Corp., Los Angeles, Calif.

900 Tons, Newark, N. J., New Jersey Turnpike Contract 43, Section 6, Franklin Contracting Co., Newark, low bidder.

600 Tons, Philadelphia, Flamingo Apartments, Turner Construction Co., contractors, to Bethlehem Steel Co., Bethlehem, Pa.

500 Tons, Chelsea, Mass., housing project, through White Construction Co., Boston, to Joseph T. Ryerson and Son, Cambridge, Mass.

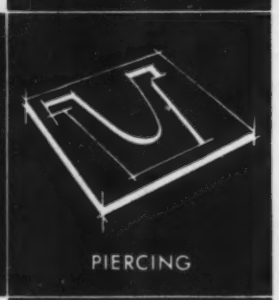
500 Tons, Louisville, Phillip Morris Co.

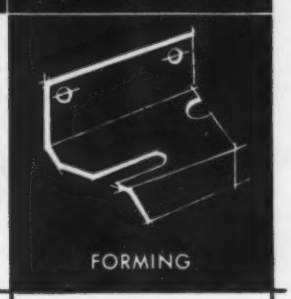
Turn to Page 120

Deep Drawing, Stamping, Embossing

Unless you have a SEIDELHUBER quotation,

You won't have the BEST PRICE!





1. Over a half-million dollars in specialized stamping and deep drawing equipment at your service! Not a cent invested by you!
2. A nationally reputed organization of thoroughly trained, long experienced engineers . . . production planners . . . tool designers . . . skilled machine operators—and not a penny added to *your* payroll!
3. Accurate and notably low estimates . . . firm quotations . . . specific per-piece costs for you.
4. Production schedules and delivery problems solved through complete cooperation in planning, designing and delivery timing. As reliable and efficient as if the entire operation were in your own plant!
5. *Most advanced methods of cutting costs for you*—We also specialize in low cost dies where small quantities do not justify or permit costly dies. We use lead, rubber and Kirksite and are thoroughly experienced in using these materials for short-run production requirements.

METALWORKING (All Kinds of Metals)
Blanking, Forming, Punching, Drawing, Embossing, Stamping, Shearing

SUB-ASSEMBLY, FABRICATION
Stampings Assembly, Welding—Arc, Gas, Seam and Spot, Etc.

TOOL MAKING
Dies, Jigs, Fixtures

FINISHING
Cleaning, Tumbling, Heat Treating, Plating and Enameling

SINCE 1906
Engineers and Manufacturers of Fine
Quality Metal Products for Industry and Home

Guaranteed Finest Quality

SEIDELHUBER IRON & BRONZE WORKS, INC.

3693 DUWAMISH AVENUE • SEATTLE 4, WASHINGTON

Continued from Page 118

building, to U. S. Steel Supply Co., Chicago.

410 **Tons,** Cleveland, Gordon Park Seawall, to Builders Structural Steel Co., Cleveland.

355 **Tons,** Secaucus, N. J., New Jersey Turnpike Contract 49, Section 7, L. Dorer Construction Co., Irvington, N. J., low bidder.

325 **Tons,** Dayton, Salem Avenue Bridge, to U. S. Steel Supply Co., Chicago.

300 **Tons,** Chicago, Illinois Paint Co., to Jos. T. Ryerson and Sons, Chicago.

194 **Tons,** San Francisco, Calif., construc- of Mission St. Viaduct over Alemany Blvd., through Granite Construction Co., Watsonville, Calif., to Soule Steel Co., San Francisco, Calif.

185 **Tons,** Cleveland, Euclid-Glenville Hospital to Patterson Leitch Co., Cleveland.

180 **Tons,** Cleveland A & P Produce Warehouse, Cleveland, to Patterson Leitch Co., Cleveland.

178 **Tons,** Bolton, Conn., reinforced concrete pavement and three span composite beam bridge. E. B. Burdick, Hartford, Conn., district engineer. D. Arrigoni, Middletown, Conn., low bidder.

125 **Tons,** Yolo County, Calif., construction of graded highway and two grade separation, through Charles MacClosky Co., and Harms Brothers, Sacramento, Calif., to Joseph T. Ryerson and Son, Inc., Emeryville, Calif.

110 **Tons,** Long Beach, Calif., demolish Anaheim St. bridge and construct piers of new bridge, through Guy F. Atkinson Co., Wilmington, Calif., to Southwest Steel Rolling Mills, Los Angeles, Calif.

Reinforcing bar inquiries this week included the following:

1000 **Tons,** Dayton, Miami Valley Hospital.

875 **Tons,** Pittsburgh, V. A. Hospital.

535 **Tons,** Crawford County, Pa., Pennsylvania Dept. of Highways, LR/9/-TR6-19-322.

450 **Tons,** Minneapolis, Downtown Auto Park, Inc.

450 **Tons,** Chicago, Town House, Inc.

400 **Tons,** South Bend, science bldg., Notre Dame University.

300 **Tons,** Cleveland, building, Pittsburgh Plate Glass Co.

185 **Tons,** Huron, Ohio, elementary school.

170 **Tons,** Springfield, Ill., Swinte Pavilion, Illinois State Fair Grounds.

165 **Tons,** Milwaukee, 24th Street school.

160 **Tons,** Akron, Ohio, Kenmore School.

160 **Tons,** Milwaukee, 53rd Street school.

135 **Tons,** Glastonbury, Conn., three rolled beam bridges and approaches, E. E. Budrick, Hartford, Conn., district engineer.

100 **Tons,** Mound, Minn., grade school.

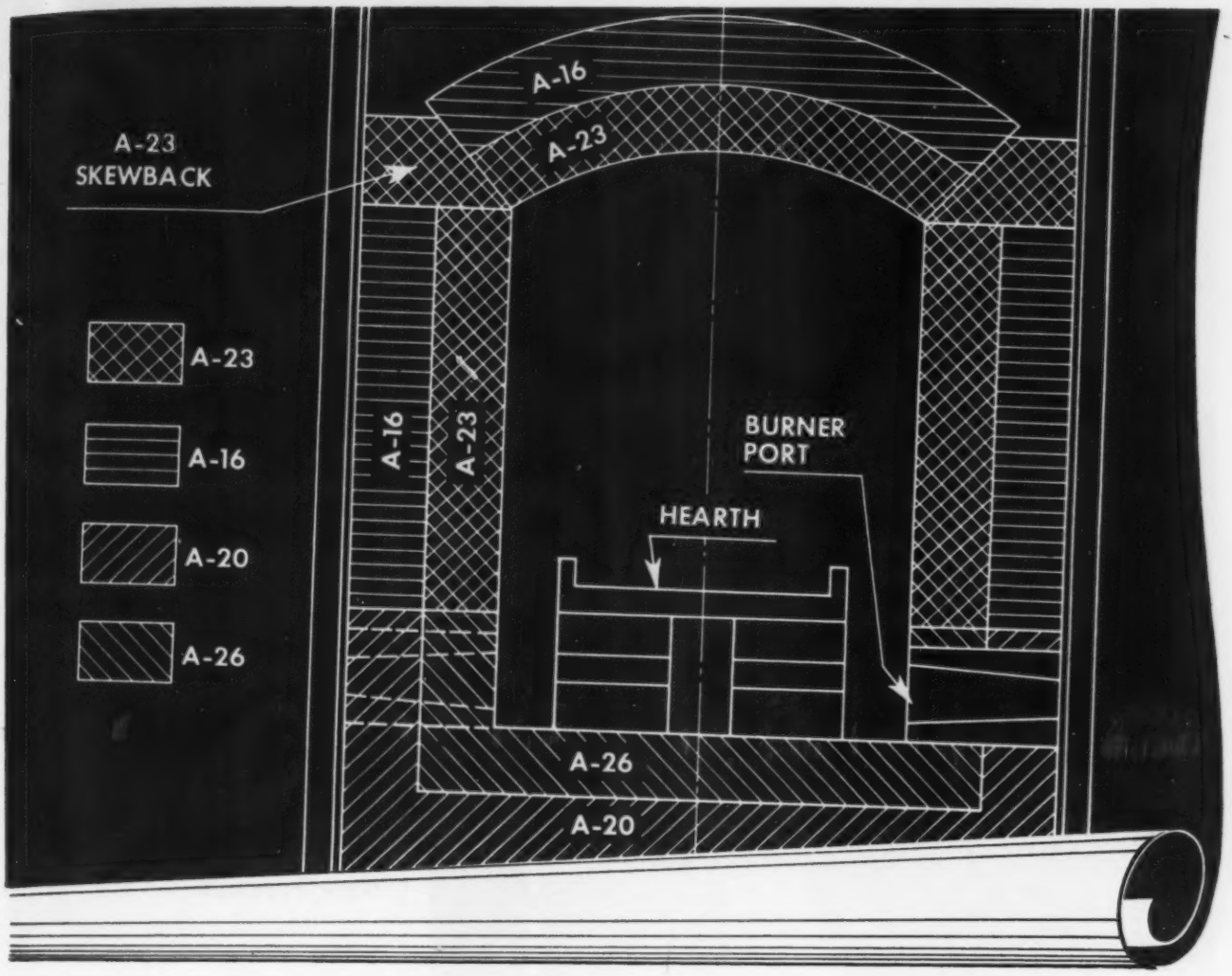
100 **Tons,** Chicago, breakwater extension.

Defense Spurs Plant Expansion

Washington—As a result of the stepped-up defense production program, American business and industry now expects to lay out nearly $2 billion more for plant expansion and equipment than had been estimated at the beginning of 1950.

Revised estimates compiled jointly by the Commerce Dept. and the Securities Exchange Commission indicate that $17.9 billion will be spent this year rather than the earlier estimate of about $16.1 billion.

Most of the expected increase will be accounted for by manufacturing concerns.



Which brick does the best job?

There's no set rule to follow for selecting the type of insulating fire brick to use in a furnace. Furnace design and operating conditions dictate which brick or combination will do the best job.

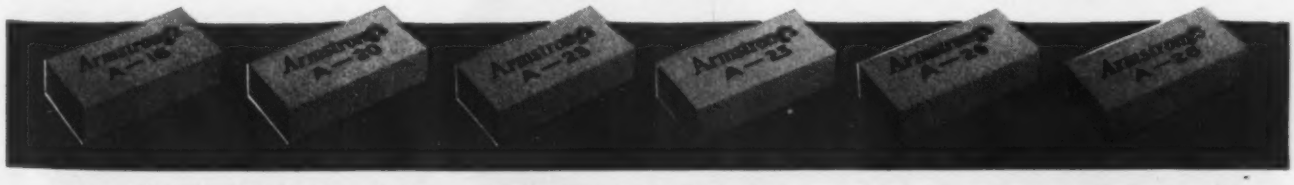
A gas-fired furnace of the kind shown here may require 4 types of brick for top performance.

In this furnace the arch and exposed sidewalls down to the level of the hearth are lined with Armstrong's A-23 Insulating Fire Brick. These brick withstand high operating temperatures, the thermal shock of door openings, and the mechanical abuse of the objects being treated. Backing up the A-23's are A-16's which have high insulating efficiency, reduce fuel costs.

Fired through burner ports just above the floor, this furnace has its greatest concentration of heat below the hearth. For this reason, the furnace floor and the sidewalls up to the hearth are lined with A-26 brick. A-20's are used under the hearth, and as back-up for the lower section of the sidewalls.

Armstrong produces 6 types of insulating fire brick for temperatures from 1600° F. to 2800° F. In its temperature range, each brick is made not only to meet the insulation requirements expected of it, but also to resist spalling and shrinkage and to be light in weight yet strong enough to withstand abuse. Physical properties of insulating fire brick vary from type to type. To improve design and cut operating costs, the right type must be used at the right place.

An Armstrong engineer will help you select the insulating refractories best suited to your requirements. Call your nearest Armstrong office or write directly to Armstrong Cork Company, 4909 Mulberry Street, Lancaster, Pennsylvania.



ARMSTRONG'S INSULATING REFRACTORIES

FREE

PUBLICATIONS

Continued from Page 34

last trainee heads for home. An appendix containing a comprehensive check list for use in preparing and conducting a meeting is included. *United States Steel Corp.*

For free copy insert No. 8 on postcard, p. 35.

Pipeline Protection

Scotch brand electrical tape No. 22, for protecting pipelines against corrosion by water, salt water, acids, alkalies, and soils, is described in a new 4-p. brochure. Possible savings of approx. 50 pct over other methods are cited in the folder, which also includes a series of photos on application technique, and tables of the tape's chemical, physical and electrical properties. *Minnesota Mining & Mfg. Co.*

For free copy insert No. 9 on postcard p. 35.

New Furnace

A 4-p. illustrated folder describes a new batch-type furnace for controlled atmosphere heat treating. The folder discusses the completely automatic cycle of the furnace, with drawings covering the cycle and suggestions on how the furnace can fit into production lines. The many new features of the equipment are also covered. *Holcroft & Co.*

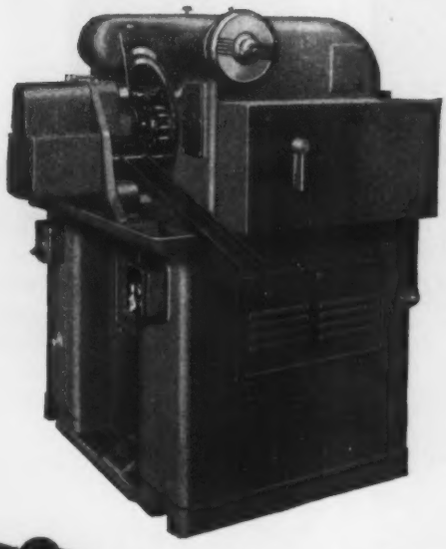
For free copy insert No. 10 on postcard p. 35.

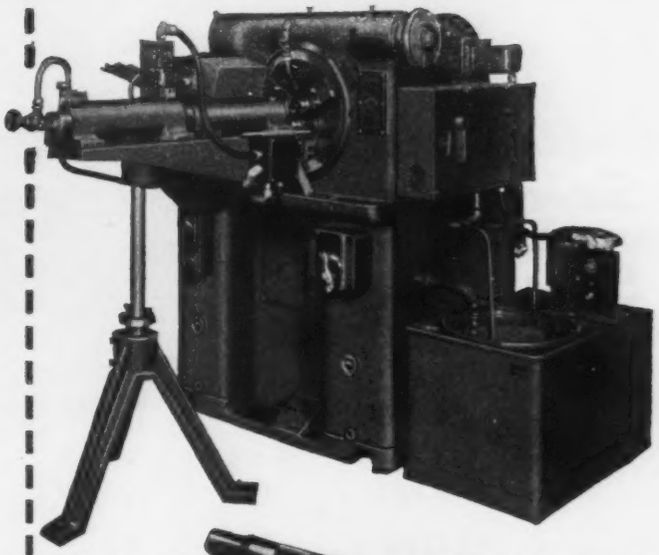
Hydraulic Oils

The importance of using the correct hydraulic oil to obtain higher production speeds, precise control, and longer production is stressed in a new 8-p. booklet. Directed primarily to executives and oil buyers without a technical background, the concise descriptions of Sun hydraulic oils and recommended applications are expected to aid in the selection of the most advantageous oil for each type of operation and plant condition. A chart shows the useful life characteristics of these oils in relation to time and temperature. *Sun Oil Co.*

For free copy insert No. 11 on postcard p. 35.

Resume Your Reading on Page 35





Thin-wall brass hose connection threaded at rate of over 2,000 per hour, using hand loader, electrically and hydraulically controlled. Parts are automatically positioned and stripped. Three-roll head used.

Typical motor shaft serration job. Magazine loader is adjustable for several different lengths. This 5½" serration on 11/16" diam. produced in machine time of 6 seconds per shaft. Three roll head and hydraulic feed through.

THREADING **FORMING**

You can ROLL it
--More Accurately--More Economically
on a NAMCO

The Namco Triple Roll Hydraulic Thread and Form Rolling Machine is built for precision *and production*. It is equally at home on solid or hollow work; three point direct roll support eliminates distortion.

The addition of magazine feed and hydraulic loader further decreases cycle time in the production of close tolerance, fine finish work in mass quantities. Capacities range from ⅜" to 1½" diameter using three rolls—and ⅛" to 9/16" using two rolls.

Send us samples of the jobs you do; we'll be glad to prepare a recommendation and quotation on your requirements.

Ask us for your copy of this twelve page bulletin (TR49) giving complete details on the Namco Thread Roller.

The NATIONAL ACME CO.

170 EAST 131st STREET • CLEVELAND 8, OHIO

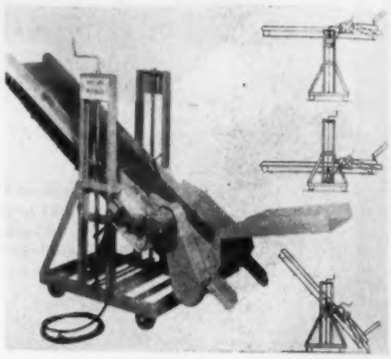
Acme-Gridley Bar and Chucking Automatics: 1-4-6 and 8 Spindle • Hydraulic Thread Rolling Machines • Automatic Threading Dies and Taps • The Chronolog • Limit, Motor Starter and Control Station Switches • Solenoids Centrifuges • Contract Manufacturing

NEW

PRODUCTION IDEAS

Continued from Page 38

charge high production items. Height and pitch adjustments are made by a double-screw center lift and a crank handle. Portability is provided by two swivel and two stationary casters. Little Hustler con-



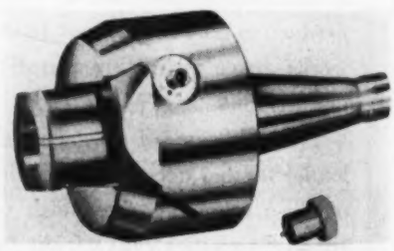
veyers feature all-steel welded construction and are available 4, 6, 8, 10 and 12 ft long with belts 12, 18, or 24 in. wide. Standard belting is cleated white cotton or neoprene impregnated. *May-Fran Engineering, Inc.*

For more data insert No. 26 on postcard, p. 35.

Boring Head

For use in popular size vertical mills, jig borers, turret lathes.

An intermediate size offset boring head is 3 11/16 in. diam and has a maximum boring capacity of



4½ in. An extension attachment increases the capacity 100 pct. The No. 3-50 boring head contains features of both the smaller and larger models. *Everede Tool Co.*

For more data insert No. 27 on postcard, p. 35.

Peg Rack Conveyer

For the handling and protection of machine or polished parts.

A new adjustable peg rack conveyer is said to cut costs by bring-

Maxi-Power more power in less space

MAXI-POWER HELICAL
GEAR DRIVE
TRIPLE REDUCTION

Specify Foote Bros. Maxi-Power For . . .

EXTRA PERFORMANCE — **Generated helical gearing assures maximum accuracy and uniform load distribution—gearing positively located for full tooth engagement across the entire face—this means improved performance.**

MAXIMUM DURABILITY — **Improved design—rugged construction—highest quality gear materials — accurate manufacture to close tolerances—provide in-built dependability for heavy-duty service.**

POWER SAVING EFFICIENCY—**Anti-friction bearings throughout—rugged housing to maintain the initial accurate gear alignment — effective lubrication — assure operating efficiency of 96% to 98½%.**

Here's Foote Bros.' latest development in parallel shaft enclosed helical gear drives that offer industry more power —greater compactness—higher quality.

The increased power capacity of Maxi-Power drives means smaller size units and utmost space economy. Maxi-Power drives are rugged—yet quiet and smooth in operation—with built-in stamina for long, economical service life.

There is a Maxi-Power speed reducer to fit practically any industrial application. Forty-two sizes, single, double and triple reductions in ratios from 2.08 up to 360 to 1 provide capacities up to 1,550 h.p. Write for a copy of the complete Maxi-Power Bulletin or call the Foote Bros. Representative in your city.

FOOTE BROS. GEAR AND MACHINE CORPORATION
Dept. M, 4545 South Western Blvd. • Chicago 9, Ill.

FOOTE BROS.

Better Power Transmission Through Better Gears

Foote Bros. Gear and Machine Corporation
Dept. M, 4545 S. Western Boulevard, Chicago 9, Illinois
Send me Bulletin MPA on Foote Bros. Maxi-Power Drives

Name.....

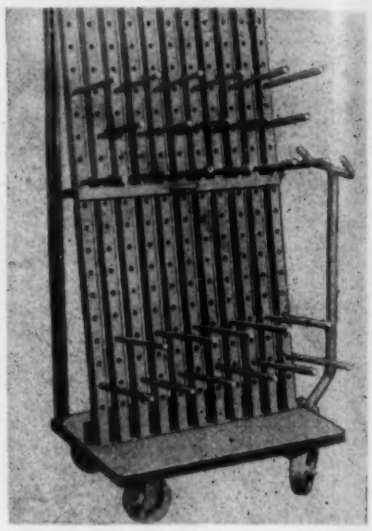
Company.....

Position.....

Address.....

City..... State.....

ing to the machine operator his work properly positioned for fast handling. The conveyer facilitates handling parts of practically any



size, shape, or weight. Its construction eases floor congestion and is said to rate high in the prevention of accidents. *Rack Engineering Co.*

For more data insert No. 28 on postcard, p. 35.

Wrenchless Chuck

Fast action, self-adjustment; holds ⅜ to 2⅜ in. OD pipe.

Rapid chucking, releasing and repositioning of cylindrical parts as large as 2⅜ in. diam are possible with the new self-adjusting

Roto-Lok wrenchless chuck. No adjustment of the chuck jaws is required for gripping stock of different diameters, and no bushings are necessary. When the handwheel is turned, three jaws advance simultaneously until the

NO-OX-ID "C" applied to bus wheels prevents corrosion and keeps tires from sticking to the metal rims.

NO-OX-ID "GG" and No. 4 Wrapper prevent corrosion, eliminate condensation on 8-inch cold water line.

WHEREVER CORROSION THREATENS DEARBORN NO-OX-ID PROTECTS

Pictured here are just two of the thousands of places where the correct NO-OX-ID will prevent costly corrosion . . . make maintenance easier. NO-OX-IDs protect valuable equipment in your plant against destructive corrosion. Maintenance costs go down and profits go up with NO-OX-IDs on the job.

NO-OX-ID rust preventives will also eliminate destruction caused by corrosion on the metal products you manufacture while in production . . . in storage . . . in shipment . . . and on your dealers' shelves. Contact your Dearborn engineer. He will assist you in the selection of the correct NO-OX-IDs for protection against corrosion of your products and in your plant.

DEARBORN CHEMICAL COMPANY
General Offices: 310 S. Michigan Ave. • Chicago 4, Illinois

Dearborn
Reg. U. S. Pat. Off.
THE ORIGINAL RUST PREVENTIVE
NO – OX – ID
IRON + OX = RUST

MAIL THE COUPON FOR THIS BOOKLET
An interesting, informative booklet which gives a complete introduction to the selection and uses of NO-OX-ID rust preventives will be sent on request.

DEARBORN CHEMICAL COMPANY
310 S. Michigan Ave., Dept IA
Chicago 4, Illinois

Gentlemen:

Please send me your NO-OX-ID rust preventive booklet.

Name.....

Company.....

Address.....

City.....*State*.....

work has been positively gripped and automatically centered. Work held in the jaws may be repositioned or removed from the chuck without halting the spindle rotation. *Peerless Machine Co.*

For more data insert No. 29 on postcard, p. 35.

Featherweight Tractor

1510-lb tractor tows 10-ton load; has full magnetic contactor control.

This battery-operated tractor is said to be extremely powerful for its size, developing ultimate draw-

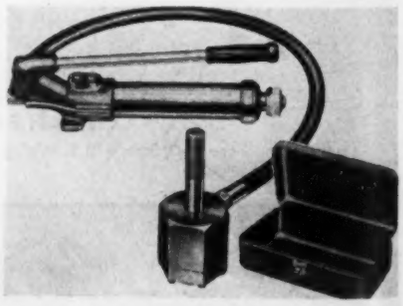
bar pull of 1000 lb. Built for narrow aisle and cramped quarter assignments, its frame measures 19 in. and at the broadest point is only 30 in. wide. It measures 45 in. long. *Automatic Transportation Co.*

For more data insert No. 30 on postcard, p. 35.

Draw Bar

Pulls ½ to 4-in. conduit holes in 51 sec without manual exertion.

The new pump operated Ohio draw bar eliminates danger of



short-circuiting adjacent wires; will not warp, break, tear or distort metal. Successful application on metals up to 10 gage is reported. Thirty-pound pressure on handle

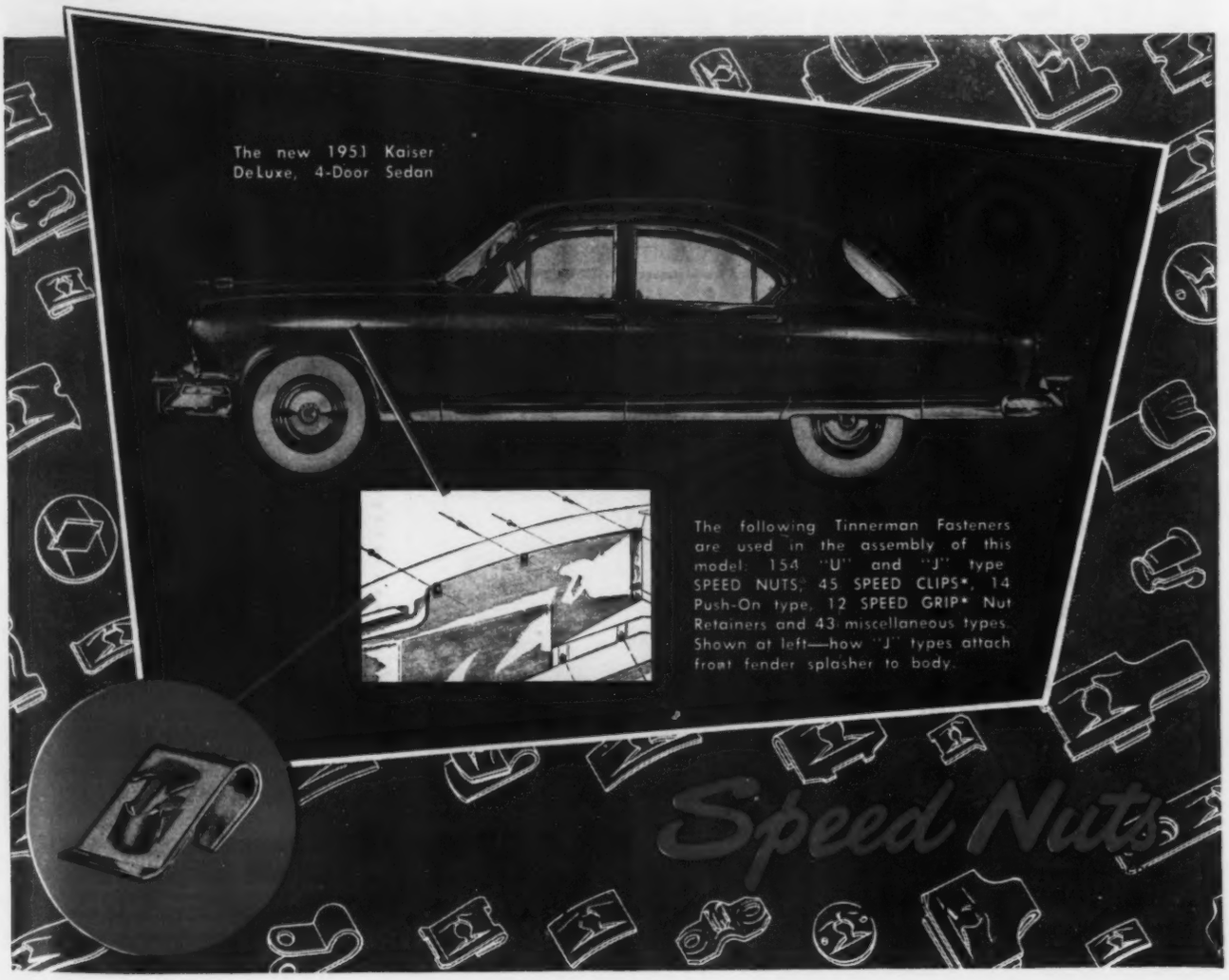
1951 KAISER Takes SPEED NUT Route To *better assembly*

When the sleek, new Kaiser for 1951 was taking shape on designers' drawing boards, an important economy and performance decision was made. On the basis of previous experience, it was agreed that maximum use should be made of SPEED NUTS for vital fastening functions.

From bumper to bumper of the new car, K-F engineers made the most of the cost-saving, product-improving assembly advantages of SPEED NUTS. Result . . . there are 269 of these lightning-fast, self-locking fasteners used for various attachments on all Kaiser models.

Kaiser-Frazer's reasons for specifying SPEED NUT brand fasteners can be yours: they're the most economical and effective fasteners ever developed. Let us prove it with a comprehensive Fastening Analysis of your product. Meanwhile—get your copy of "Savings Stories", a book-full of cost-saving fastening ideas.

Ask your Tinnerman representative for a copy, or write: TINNERMAN PRODUCTS, INC., Cleveland, Ohio. In Canada: Dominion Fasteners Ltd., Hamilton. In Great Britain: Simmonds Aerocessories, Ltd., Treforest, Wales.



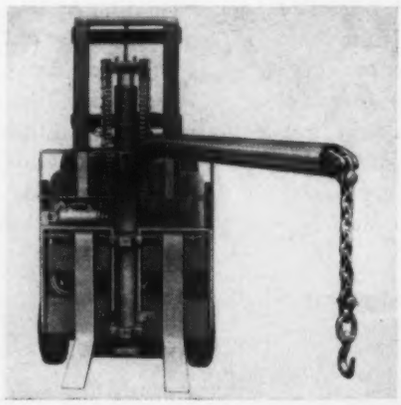
is said to produce 12,000-lb pressure on cutting surfaces, and cuts a clean, smooth edge conduit hole. It performs in any desired position with pump at vertical or horizontal angles. The device uses cutters now standard for hand operated knockout punches. *Patterson Equipment Co.*

For more data insert No. 31 on postcard, p. 35.

Slewing Crane Arm

Permits positioning in freight cars of 800-lb loads at 80-in. load center

The crane arm is pivoted so that a two-way hydraulic cylinder can swing it laterally 20° to either side



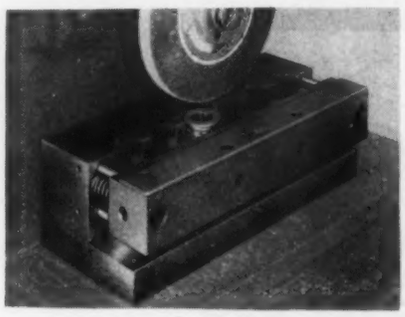
of center. The unit is readily detachable permitting the truck to be used with standard pallet forks. *Towmotor Corp.*

For more data insert No. 32 on postcard, p. 35.

Gang Vises

In 3 and 6 position models for precision grinding small parts.

Both models of the improved gang vises incorporate equalizing

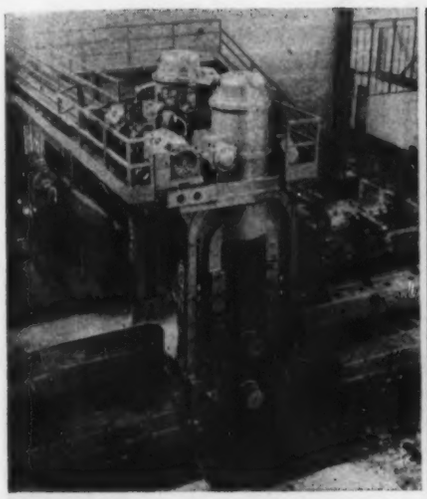


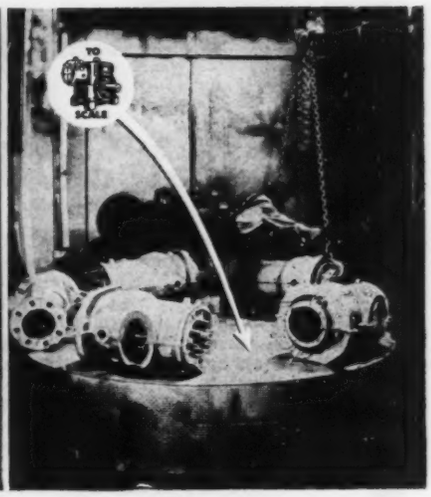
blades that automatically compensate for differences in work tolerances and eliminate toeing-in of undersize parts. The three position model is designed primarily for use with a magnetic chuck and holds work in a central position, making

For Iron and Steel, too

CONE-DRIVE GEARS save

Space–Money–Headaches





HANDLE HEAVY DUTY LOADS

For example, this Morgan Engineering Company 40″ blooming mill, like other Morgan equipment (box-chargers, trolleys, etc.) uses Cone-Drive gears to handle the full torque heavy-duty shock loads of the screw-downs. Center distance of the gear sets is only 24 in. to handle 150 hp at 460 rpm using a mill type motor. It would take a much larger non-Cone-Drive gear set to approach the same load capacity, of course.

SAVE MONEY IN CONTINUOUS SERVICE

Wheelabrator Tumblasts know how to "take it"—the loader and mill are operated through standard Cone-Drive reducers. WHY? American Wheelabrator & Equipment Corporation says: "We use Cone-Drives for this application because they conserve space, give us freedom from service trouble and SAVE US MONEY." The unit shown (under construction) has a capacity of 30 cu. ft. of castings. The reducer is a 5″ center distance (4.6 hp at 780 rpm) Cone-Drive.

GIVE RESERVE CAPACITY IN LIMITED SPACE

This Hydro-Blast turn-table turns 25 tons of castings at one time under high pressure streams of sand and water. Operated through a Cone-Drive double-reduction unit (600 to 1) made up of *standard* 2½″ and 5″ reducers. Over-all height is less than 19 in. Nearest other reducer would have been 26″ high. Yet the Cone-Drive reducer (shown to scale) has a torque capacity of 25,000 in.-lbs, some 11,000 in.-lbs in excess of actual requirement.

CONE-DRIVE GEARS®

CONE-DRIVE GEARS

Division, Michigan Tool Company

DOUBLE ENVELOPING GEAR SETS & SPEED REDUCERS

7171 E. McNichols Road • Detroit 12, U.S.A.

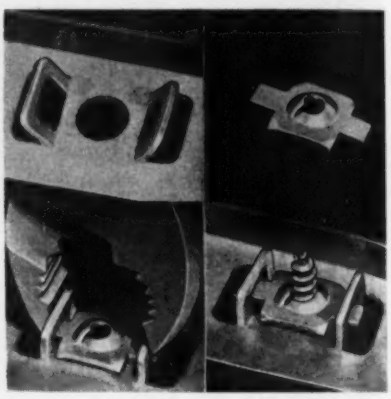
it possible to flop the fixture for grinding opposite sides without additional adjustments. Capacity is ¾ x 1½ in. The six position gang vise is used on magnetic or nonmagnetic chucks. It has a standard capacity for ⅛ to 1-in. parts with central positioning of the work. *Dery Tool & Die Co.*

For more data insert No. 33 on postcard, p. 35.

Cage Nut

Requires no separate cage, eliminates spot welding.

The cage for the new cage nut, P-1079, is punched right in the sheet metal as a nut holder. Two loops, formed at 45° angles in the sheet metal, plus the new sheet metal nut are assembled by pinching the loops up with pliers, after dropping the nut over the loops,



making an inexpensive floating cage nut. These fit popular sizes of sheet metal screws and are made of spring steel or mild steel, depending on the torque requirement. *Prestole Corp.*

For more data insert No. 34 on postcard, p. 35.

Drill Level Attachment

Facilitates drilling straight holes vertically, horizontally, at angles.

Called the Midget Ken-Drill level attachment, this tool for portable electric hand drills has a slotted base from the center of which rises a holder containing a protected bubble-level unit. This may be set at any desired angle up to 90° by means of a hand set screw. Accurate drilling is said to be possible by watching the bubble and keeping it between two guide lines. *Singer Kennedy Corp.*

For more data insert No. 35 on postcard, p. 35.

Resume Your Reading on Page 39

Briefs and Bulletins

shipping space ruling — The Interstate Commerce Commission has moved to reduce shipping space shortages by penalizing shippers for wasting space. Effective Sept. 20, a shipper who accepts and uses a larger car than ordered or two cars instead of one must pay the full minimum charge on the car or cars instead of the minimum ordered fee. He can choose waiting until a smaller car is available. General exceptions include cars for livestock shipment and longer-than-ordered flat cars. Expiring Mar. 31, 1951, the order does not apply to rail unloadings from ships.

pig iron and coke—Eastern suppliers of both pig iron and coke are in agreement that the supply situation for both is going to get worse, and one stated that the earliest possible improvement would be next spring. The Alan Wood 700-ton-per-day furnace, which had been scheduled to go out of blast for repairs, is still producing iron because of the shortage. Meanwhile, foundries are crowded with orders and their demand for material is running up the price of foundry grades of scrap.

changes—A considerable amount of 18-8 stainless trim used in Detroit has already been changed over to straight chrome stainless. However, those who used stainless stamped grilles instead of die castings are not finding the shift so easy. In some cases there has been difficulty forming the chrome steel to a shape that was easy when the part was made of 18-8.

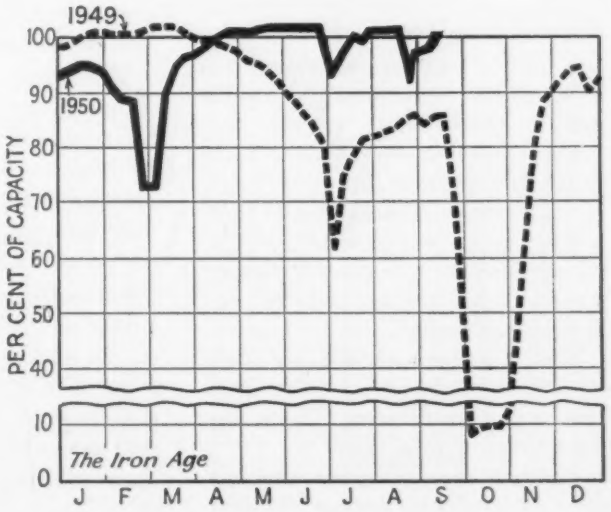
silvery iron boost—Electric furnace silvery pig iron prices have been increased by Keokuk Electro-Metals Co. The f.o.b. Keokuk, Iowa, or Wenatchee, Wash., price for 14.01 to 14.50 pct silicon is now $82.00 per gross ton. "Keokuk" 12½ lb piglets are now $86.00 per gross ton f.o.b. Keokuk. Extras remain the same.

defense pipe—Smaller pipe fabricators are getting increasing orders from the Army and Navy. The Army Corps of Engineers in Chicago has an inquiry out for 1,448,344 ft of 6⅝ in. API line pipe.

conversion—An Ohio producer of cold-rolled strip reports that 60 to 75 pct of its production is from conversion steel. About 25 to 40 pct of its hot-rolled bands are obtained from producers with whom they have a long standing. The rest is supplied by customers who get it from a variety of sources and sell it to the producer at mill prices. After converting it to cold-rolled strip the producer sells it to the customers at regular mill prices. What the customer originally paid for the hot-rolled bands doesn't enter into the transaction.

spiegeleisen prices—New Jersey Zinc Sales Co. has raised its prices on spiegeleisen effective Sept. 14. New prices are: 16 to 19 pct Mn, 3 pct max. Si, $69.00 per gross ton; 19 to 21, 21 to 23 or 23 to 25 pct Mn, 3 pct max. Si, $70.00, 4 pct max. Si, $72.00, 26 to 28 pct Mn, 3 pct max. Si, $80.00.

Steel Operations**



District Operating Rates—Per Cent of Capacity**

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
Sept. 19	97.0*	102.0	93.0	92.0	96.0*	104.0	100.0	104.0	105.0*	106.0	93.0	91.0	90.0	100.0
Sept. 17	99.0	102.5	93.0	92.0	97.0	104.0	102.0	108.0	101.0	105.0	89.0	91.0	102.0	100.5

* Revised.

** Steel operations for the first half of 1950 are based on annual capacity of 99,392,800 net tons. Beginning July 1, 1950, operations are based on new annual capacity of 100,563,500 net tons.

Nonferrous Metals OUTLOOK

Market Activities

Confusion reigns concerning defense needs of copper . . . Possibility of losing imports of strategic metals to other countries . . . Tungsten situation getting worse.

New York—Just now coming to light is the actual confusion facing the copper industry. Everybody knew that it was pretty bad, but the copper people are as much in the dark about defense requirements as are the aluminum and magnesium producers.

A priorities and allocation program seems to be on the way but nobody knows who needs how much and for what purpose. Not only that, but who is to say just which fabricated products are most important and therefore receive the highest priority? It's the old World War II problem all over again, intensified, in a way, by the fact that we are not engaged in an all-out war. There will be some civilian non-essential production that will complicate matters more than a little.

Imports May Have Dim Future

There is some worry about the effect of price controls, if imposed, on the imports of copper and other strategic materials which must be brought into the U. S. It is felt by some in the trade that a fixed price would send foreign copper producers looking for other buyers who would not be restricted pricewise.

One obvious solution to this would be a direct subsidy from the U. S. Government. There are objections to this, too.

Making the situation tougher now than it was during the last war is the fact that there are more foreign interests who might want the copper which is usually sent to the U. S. Western Europe is the perfect example of this.

General indications of the movement of some world capital away from the American dollar and toward the pound sterling and the Canadian dollar can also be expected to have a profound effect on imports of all materials to this country.

Meanwhile, conversion deals continue to inflate the copper scrap market. Ingot makers and custom smelters prices for No. 2 heavy copper and wire remain at 20.75¢ per lb but scrap for conversion purposes is bringing as high as 23¢ per lb. For this reason it is becoming more difficult for the refiners to obtain scrap.

The rash of price increases which broke out two weeks ago has now tapered off somewhat, but mercury is now quoted at $83 to $85 per 76-lb flask, a rise of $5.00 from last week. Tin was also making small gains last week.

Refined copper stocks showed a gain of 2686 net tons during the month of August. However, there were only 50,952 tons on hand at the close of the month. At current consumption rates this is less than one month's supply and it compares with a stock of 217,000 tons at this point in 1949.

Fabricators received 112,083 tons of refined copper during August for a daily average of 3616 tons, very slightly under the daily average for the first 8 months of this year. Refined copper production from both domestic and foreign sources rose from 96,734 tons in July to 108,465 tons in August.

Tungsten Supply Tightening

Supplies of tungsten are also becoming more critical and, since imports of tungsten from China were cut off early this year, Russia now controls 75 pct of the world's supply. And now the U. S., which usually consumes 26.5 pct of world production, will need even more for mobilization.

Even though the price of tungsten ore has doubled in the last few months, the price is still too low for domestic mining firms to undertake new projects. The number of domestic tungsten mines has dropped from 50 during World War II to four today.

NONFERROUS METALS PRICES

	Sept. 13	Sept. 14	Sept. 15	Sept. 16	Sept. 18	Sept. 19
Copper, electro, Conn.	22.50–24.50	22.50–24.50	22.50–24.50	22.50–24.50	22.50–24.50	22.50–24.50
Copper, Lake, delivered	24.625	24.625	24.625	24.625	24.625	24.625
Tin, Straits, New York	$1.02	$1.03	$1.03	....	$1.01	$1.02*
Zinc, East St. Louis	17.50	17.50	17.50	17.50	17.50	17.50
Lead, St. Louis	15.80	15.80	15.80	15.80	15.80	15.80

Note: Quotations are going prices.
* Tentative.

MILL PRODUCTS

Aluminum

(Base prices, cents per pound, base 30,000 lb, f.o.b. shipping point, freight allowed)

Flat Sheet: 0.188 in., 2S, 3S, 27.4¢; 4S, 61S-O, 29.3¢; 52S, 31.4¢; 24S-O, 24S-OAL, 30.3¢; 75S-O, 75S-OAL, 36.8¢; 0.081 in., 2S, 3S, 28.4¢; 4S, 61S-O, 30.7¢; 52S, 32.8¢; 24S-O, 24S-OAL, 31.4¢; 75S-O, 75S-OAL, 38.5¢; 0.032 in., 2S, 3S, 30.0¢ 4S, 61S-O, 34.0¢; 52S 36.7¢ 24S-O, 24S-OAL, 38.4¢; 75S-O, 75S-OAL, 48-1¢.

Plate: ¼ in., and heavier: 2S, 3S, F, 24.8¢ 4S-F, 27¢; 52S-F, 28.1¢; 61S-O, 27.6¢; 24S-F, 24S-FAL, 28.1¢; 75S-F, 75S-FAL, 34.9¢.

Extruded Solid Shapes: Shape factors 1 to 4, 33.6¢ to 67¢; 11 to 13, 34.3¢ to 79¢; 23 to 25, 36.3¢ to $1.08; 35 to 37, 43.3¢ to $1.66.

Rod Rolled: 1.5 to 4.5 in., 2S-F, 3S-F, 34.5¢ to 31¢; Cold-finished, 0.375 to 3 in., 2S, 3S, 37¢ to 32.5¢.

Screw Machine Stock: Rounds, 11S-T3, R317-T4, ⅛ to 11/32 in., 49.5¢ to 35.5¢; ⅜ to 1½ in., 38¢ to 36¢; 1 9/16 to 3 in., 36¢ to 33¢; 17S-T4 lower by 1¢ per lb. Base 5000 lb.

Drawn Wire: Coiled, 0.051 to 0.374 in.; 2S, 36.5¢ to 27¢; 52S, 44.5¢ to 32.5¢; 56S, 47.5¢ to 39¢; 17S-T4, 50.5¢ to 35¢; 61S-T4, 45¢ to 34.5¢; 75S-T-6, 76.5¢ to 55.5¢.

Extruded Tubing, Rounds: 63S-T5; OD in in.: 1¼ to 2, 33.5¢ to 49¢; 2 to 4, 30.5¢ to 41.3¢; 4 to 6, 31¢ to 37.3¢; 6 to 9, 31.5¢ to 39.3¢.

Roofing Sheet, Flat: 0.019 in. x 28 in. per sheet, 72 in., $1.085; 96 in., $1.446; 120 in., $1.806; 144 in., $2.170. Gage 0.024 in. x 28 in., 72 in., $1.306; 96 in., $1.743; 120 in., $2.179; 144 in., $2.615. **Coiled Sheet:** 0.019 in. x 28 in., 26.7¢ per lb; 0.024 in. x 28 in., 25.4¢ per lb.

Magnesium

(Cents per lb, f.o.b. mill, freight allowed)

Sheet and Plate: M-O, FS-O. ¼ in. 58¢ to 60¢; 3/16 in. 60¢ to 62¢; ⅛ in. 62¢ to 64¢; B & S gage 10, 63¢ to 65¢; 12, 67¢ to 69¢; 14, 73¢ to 78¢; 16, 80¢ to 85¢; 18, 88¢ to 93¢; 20, $1.00 to $1.05; 22, $1.22-$1.31; 24, $1.62-$1.75. Specification grade higher. Base: 30,000 lb.

Extruded Round Rod: M, FS, diam in., ⅛ in. to 0.311, 66¢; ⅜ in. to ¾, 50¢; 1¼ to 1.749, 47¢; 2½ to 5 in., 45¢. Other alloys higher. Base: Up to ¾ in., diam, 10,000 lb; ¾ in. to 1¾ in., 20,000 lb; 1¾ in. and larger, 30,000 lb.

Extruded Solid Shapes, Rectangles: M, FS, in weight per ft, for perimeters of less than size indicated, 0.10 to 0.11 lb per ft, per. up to 3.5 in., 59.5¢; 0.22 to 0.25 lb per ft, per. up to 5.9 in., 55¢; 0.50 to 0.59 lb per ft, per. up to 8.6 in., 50.5¢; 1.8 to 2.59 lb per ft, per. up to 19.5 in., 47.5¢ 4 to 6 lb per ft, per. up to 28 in. 46.5¢. Other alloys higher. Base, in weight per ft of shape: Up to ½ lb, 10,000 lb; ½ lb to 1.80 lb, 20,000 lb; 1.80 lb and heavier, 30,000 lb.

Extruded Round Tubing: M, FS, wall thickness, outside diam, in., 0.049 to 0.057, ¼ in. to 5/16, $1.40; 5/16 to ⅜, $1.26; ½ to ⅝, 93¢; 1 to 2 in., 76¢; 0.165 to 0.219, ⅝ to ¾, 61¢; 1 to 2 in., 57¢; 3 to 4 in., 56¢. Other alloys higher. Base, OD in in.: Up to 1½ in., 10,000 lb; 1½ in. to 3 in., 20,000 lb; 3 in. and larger, 30,000 lb.

Nickel and Monel

(Base prices, cents per lb, f.o.b. mill)

	"A" Nickel	Monel
Sheets, cold-rolled	69	53
Strip, cold-rolled	75	56
Rods and bars	65	51
Angles, hot-rolled	65	51
Plates	67	52
Seamless tubes	98	86
Shot and blocks	..	46

Copper, Brass, Bronze

(Cents per lb, freight prepaid on 200 lb, subject to copper import duty)

	Sheets	Rods	Extruded Shapes
Copper	39.43	....	39.03
Copper, h-r	....	35.28	....
Copper, drawn	....	36.53	....
Low brass	37.72	37.41	....
Yellow brass	36.53	36.22	....
Red brass	38.11	37.80	....
Naval brass	41.43	35.49	36.75
Leaded brass	....	30.95	35.11
Com'l bronze	39.03	38.72	....
Manganese bronze	44.93	38.82	40.38
Phosphor bronze	58.02	58.27	....
Muntz metal	39.53	35.09	36.34
Everdur, Herculoy, Olympic, etc.	43.97	42.91	....
Nickel silver 10 pct	47.51	51.63	....
Arch. bronze	....	....	35.11

PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed	17.50
Aluminum pig	16.50
Antimony, American, Laredo, Tex.	32.00
Beryllium metal, 95%, lumps, beads	$95.00
Beryllium copper, 3.75-4.25% Be, dollars per lb contained Be	$30.00
Beryllium aluminum 5% Be, dollars per lb contained Be	$65.00
Bismuth, ton lots	$2.00
Cadmium, del'd	$2.40
Cobalt, 97-99% (per lb)	$1.80 to $1.87
Copper, electro, Conn. Valley	22.50 to 24.50
Copper, Lake, delivered	24.625
Gold, U. S. Treas., dollars per oz.	$35.00
Indium, 99.8%, dollars per troy oz.	$2.25
Iridium, dollars per troy oz.	$220
Lead St. Louis	15.80
Lead, New York	16.00
Magnesium, 99.8+%, f.o.b. Freeport Tex., 10,000 lb	22.50
Magnesium, sticks, 100 to 500 lb	39.00¢ to 41.00¢
Mercury, dollars per 76-lb flask f.o.b. New York	$83 to $85
Nickel, electro, f.o.b. New York	51.22
Nickel oxide sinter, f.o.b. Copper Cliff, Ont., contained nickel	44.25
Palladium, dollars per troy oz.	$24.00
Platinum, dollars per troy oz.	$100 to $103
Silver, New York, cents per oz.	72.75
Tin, New York	$1.02
Zinc, East St. Louis	17.50
Zinc, New York	18.22
Zirconium copper, 50 pct	$6.20

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5-5 ingot	
No. 115	25.50
No. 120	25.00
No. 123	24.50
80-10-10 ingot	
No. 305	29.50
No. 315	27.00
88-10-2 ingot	
No. 210	38.00
No. 215	35.00
No. 245	29.50
Yellow ingot	
No. 405	21.75
Manganese bronze	
No. 421	27.00

Aluminum Ingot

(Cents per lb, 30,000 lb lots)

95-5 aluminum-silicon alloys	
0.30 copper, max.	29.00-29.50
0.60 copper, max.	28.50-29.00
Piston alloys (No. 122 type)	27.00-27.50
No. 12 alum. (No. 2 grade)	26.50-27.00
108 alloy	27.00-27.50
195 alloy	28.00-28.50
13 alloy	28.50-29.00
AXS-679	27.50-28.00

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—95-97½%	27.50-28.00
Grade 2—92-95%	26.50-27.00
Grade 3—90-92%	25.50-26.00
Grade 4—85-90%	25.00-25.50

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, freight allowed, in 500 lb lots)

Copper	
Cast, oval, 15 in. or longer	39⅛
Electrodeposited	33⅜
Rolled, oval, straight, delivered	38⅞
Forged ball anodes	43
Brass, 80-20	
Cast, oval, 15 in. or longer	34¾
Zinc, oval	26½
Ball anodes	25½
Nickel 99 pct plus	
Cast	68.00
Rolled, depolarized	69.00
Cadmium	$2.55
Silver 999 fine, rolled, 100 oz lots, per troy oz, f.o.b. Bridgeport, Conn.	79½

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	52.15
Copper sulfate, 99.5 crystals, bbl.	12.85
Nickel salts, single or double, 4-100 lb bags, frt allowed	20½
Nickel chloride, 375 lb drum	27½
Silver cyanide, 100 oz lots, per oz.	61¼
Sodium cyanide, 96 pct domestic 200 lb drums	19.25
Zinc cyanide, 100 lb drums	45.85

SCRAP METALS

Brass Mill Scrap

(Cents per pound; add ½¢ per lb for shipments of 20,000 to 40,000 lb; add 1¢ for more than 40,000 lb)

	Heavy	Turnings
Copper	21½	20¾
Yellow brass	19⅛	17⅞
Red brass	20⅛	19⅜
Comm. bronze	20½	19¾
Mang. bronze	17¼	16¼
Brass rod ends	18⅞	....

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	21.75
No. 2 copper wire	20.75
Light copper	19.75
Refinery brass	20.00*
Radiators	15.50

*Dry copper content.

Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to producer)

No. 1 copper wire	21.75
No. 2 copper wire	20.75
Light copper	19.75
No. 1 composition	19.00
No. 1 comp turnings	18.75
Rolled brass	17.00
Brass pipe	18.50
Radiators	15.50
Heavy yellow brass	14.50-14.75
Aluminum	
Mixed old cast	16.00
Mixed old clips	16.50
Mixed turnings, dry	15.50
Pots and pans	16.00
Low copper	18.50

Dealers' Scrap

(Dealers' buying prices, f.o.b. New York in cents per pound)

Copper and Brass	
No. 1 heavy copper and wire	20 —20½
No. 2 heavy copper and wire	19 —19½
Light copper	18 —18½
Auto radiators (unsweated)	13¾—14
No. 1 composition	17 —17½
No. 1 composition turnings	16½—17
Clean red car boxes	15 —15½
Cocks and faucets	15 —15½
Mixed heavy yellow brass	12 —12½
Old rolled brass	13½—13¾
Brass pipe	15½—16
New soft brass clippings	17 —17½
Brass rod ends	15¾—16
No. 1 brass rod turnings	15½—15¾
Aluminum	
Alum. pistons and struts	9½—10
Aluminum crankcases	12 —12½
2S aluminum clippings	15 —15½
Old sheet and utensils	12 —12½
Borings and turnings	8½
Misc. cast aluminum	12 —12½
Dural clips (24S)	12 —12½
Zinc	
New zinc clippings	13½—14
Old zinc	11¼—11½
Zinc routings	8¼— 8¾
Old die cast scrap	8¼— 8¾
Nickel and Monel	
Pure nickel clippings	50 —60
Clean nickel turnings	47 —57
Nickel anodes	50 —60
Nickel rod ends	50 —60
New Monel Clippings	17 —21
Clean Monel turnings	15 —17
Old sheet Monel	16 —20
Inconel clippings	22 —26
Nickel silver clippings, mixed	13 —14
Nickel silver turnings, mixed	12 —13
Lead	
Soft scrap, lead	13½—14
Battery plates (dry)	8¾— 9
Magnesium	
Segregated solids	9 —10
Castings	5½— 6½
Miscellaneous	
Block tin	78 —80
No. 1 pewter	58 —60
No. 1 auto babbitt	50 —52
Mixed common babbitt	13 —13½
Solder joints	16½—17
Siphon tops	46 —48
Small foundry type	16½—17
Monotype	15½—16
Lino. and stereotype	14½—15
Electrotype	13¾—14¼
New type shell cuttings	18 —18½
Hand picked type shells	6½— 7
Lino. and stereo. dross	4¾— 5¼
Electro. dross	3¼— 3½

MARKETS—PRICES—TRENDS

SCRAP
Iron & Steel

Pig Iron Shortage Inflates Foundry Grades

Consumers have definitely succeeded (at least for the moment) in their efforts to halt the upward march of steelmaking scrap prices. In some centers there was token resistance to "formula" prices; elsewhere, pressure actually diminished, leaving present prices firmly entrenched.

There were some complaints from brokers who said they could not buy openhearth grades under what the mills are willing to pay. No. 1 bundles were commanding a premium in some areas.

Foundry demand remains strong, with the result that cast grades are higher in some areas. A shortage of merchant pig iron is forcing some foundries to seek bigger tonnages of cast iron to make up their melt.

PITTSBURGH — Consumers retained control of the market this week. No. 1 heavy melting held at $44.00, top, but No. 2 grade was off $1.50 to $39.50. No. 1 bundles, however, continued to command a premium. Machine shop turnings were off $1.00 to $34.00, top. No. 1 railroad was softer, down $1.00 as the latest lists moved at or close to the "formula" price of $44.00, and some tonnage was allocated at the formula figure. Scrap rails and short rails were stronger. Malleable was up $2.00 to $56.00. U. S. Steel Corp. announced that the first shipment of foreign ore, part of a consignment of 50,000 tons for September, should hit the East Coast very soon.

CHICAGO—Efforts to stabilize the market in the Chicago area seem to be working for the openhearth grades and scrap is moving steadily on last mill orders. Turnings are off $1.00 to $1.50 on the basis of broker offerings but no new mill purchases have been officially reported at the new price of $30.00 per gross ton for industrial short shoveling and $28.00 for dealer short shoveling. Foundries are said to be keeping up the price on low phos. Railroad lists sold last week brought considerably higher than the $40.00 said to be offered by the mills for No. 1 RR. heavy melting steel. No. 1 RR. heavy melting steel is off $1.00.

PHILADELPHIA — Steel grades are holding at the prices quoted last week. Dealers' yards are pretty well cleaned out and the dealers are losing some earmarked scrap, but now that the summer is about over, the autowreckers can be expected to get busy. Foundry demand remains at a high level, and all cast items are quotable at a dollar above last week's prices. Crop rails are now selling at $52.00 to $53.00, but would be scarce at any figure.

NEW YORK—No. 1 heavy melting steel took another dip and is now being quoted at a range of $32.50 to $33.00. Blast furnace grades of scrap dropped $2.00 per gross ton. The real activity in the market concerns the foundry grades which are in terrific demand because of the pig iron shortage. These grades are all $1.00 higher this week.

DETROIT—The tone of the market is dull as the concerted effort of steel scrap buyers to avoid a runaway market appears to be making headway. Except for minor adjustments there have been no appreciable changes in prices here during the past several weeks and the upward price trend appears to be halted. New industrial lists coming out next week will tell definitely whether the price line can be held. At the moment, indications are that price stability has been achieved here, temporarily at least.

CLEVELAND—A weaker undertone in the market here and in the Valley this week is putting some backbone in formula prices. One major consumer is refusing any more $44.00 tonnage and a segment of the trade is seemingly resigned to the formula. Other brokers report they cannot buy freely at $43.50 and it is true that some dealers are still shipping on higher priced orders. Key to the weaker undertone may be the threat of 30-day scrap inventories and closing of a major railroad list and allocation of part of the heavy melting tonnage to several consumers at $44.00. Foundry grades are running wild.

ST. LOUIS—The scrap market continues strong with prices generally unchanged. Heavy breakable cast moved to $40.00 to $42.00. Steel mills and foundries here are committed for their current needs and hesitate to pile up too heavy inventories because of controls. Brokers are able to buy all available scrap at present prices but add that not too much is available.

CINCINNATI — Formula prices are meeting token resistance in a somewhat unsettled scrap market here. Brokers cannot buy tonnage at the formula, and package deals are a definite possibility. Apparently consumers are inclined to pay a somewhat better price for No. 2 steel to get No. 1 heavy melting tonnage. Foundry grades are very strong and inventories are such that consumers are demanding quick shipment.

BOSTON—The market here is very quiet with openhearth grades holding at last week's prices. Blast furnace material is a bit weaker, pricewise. About 3 weeks ago foundry grades started on the upswing and are still going. No. 1 machinery cast, heavy breakable cast, and stove plate are quotable at 50¢ to $1.50 a ton higher this week.

BIRMINGHAM—The market continued strong this week in specialties, such as scrap angle bars, rail crops, etc. No. 1 cast, for the first time in several weeks, failed to advance in price, but cast iron pipe manufacturers are expected to be in the market again soon. A little more scrap is now available for the southern market but dealers and brokers are holding off buying any more than enough to fill orders because the price is considered too high. Prices are unchanged.

BUFFALO—No. 2 heavy melting and related steelmaking items followed the rise of No. 1 heavy melting in the previous week by jumping $1.50 on sales of approximately 25,000 tons. Three leading dealers participated in the sales which carried No. 2 heavy melt to a range of $37.50 to $38.50. Bundles and bushelings advanced similarly. Turnings were not included in the sales.

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Iron and Steel

SCRAP PRICES

Going prices as obtained in the trade by THE IRON AGE, based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$43.50 to $44.00
No. 2 hvy. melting	39.00 to 39.50
No. 1 bundles	45.50 to 46.00
No. 2 bundles	38.50 to 39.00
Machine shop turn.	33.50 to 34.00
Mixed bor. and ms. turns	33.50 to 34.00
Shoveling turnings	36.50 to 37.00
Cast iron borings	35.50 to 36.00
Low phos. plate	49.50 to 50.00
Heavy turnings	42.50 to 43.00
No. 1 RR. hvy. melting	44.00 to 45.00
Scrap rails, random lgth.	52.50 to 53.00
Rails 2 ft and under	55.00 to 56.00
RR. steel wheels	52.00 to 53.00
RR. spring steel	52.00 to 53.00
RR. couplers and knuckles	52.00 to 53.00
No. 1 machinery cast	51.50 to 52.00
Mixed yard cast.	45.50 to 46.00
Heavy breakable cast.	40.50 to 41.00
Malleable	55.00 to 56.00

Chicago

No. 1 hvy. melting	$40.00
No. 2 hvy. melting	38.00
No. 1 factory bundles	40.00
No. 1 dealers' bundles	40.00
No. 2 dealers' bundles	$34.00 to 35.00
Machine shop turn.	28.50 to 29.50
Mixed bor. and turn.	28.50 to 29.50
Shoveling turnings	30.00 to 31.00
Cast iron borings	30.00 to 31.00
Low phos. forge crops	49.00 to 50.00
Low phos. plate	48.00 to 49.00
No 1 RR. hvy. melting	43.50 to 44.50
Scrap rails, random lgth.	54.50 to 55.50
Rerolling rails	57.00 to 58.00
Rails 2 ft and under	61.00 to 62.00
Locomotive tires, cut	50.00 to 51.00
Cut bolsters & side frames	49.00 to 50.00
Angles and splice bars	54.00 to 55.00
RR. steel car axles	74.00 to 75.00
RR. couplers and knuckles	49.00 to 50.00
No. 1 machinery cast.	49.00 to 50.00
No. 1 agricul. cast.	46.00 to 47.00
Heavy breakable cast.	38.00 to 39.00
RR. grate bars	38.00 to 39.00
Cast iron brake shoes	41.00 to 42.00
Cast iron car wheels	42.00 to 43.00
Malleable	57.00 to 58.00

Philadelphia

No. 1 hvy. melting	$38.00 to $39.00
No. 2 hvy. melting	35.00 to 36.00
No. 1 bundles	38.00 to 39.00
No. 2 bundles	31.00 to 32.00
Machine shop turn.	27.00 to 28.00
Mixed bor. and turn.	25.00 to 26.00
Shoveling turnings	32.00 to 33.00
Low phos. punchings, plate	44.00 to 45.00
Low phos. 5 ft and under.	44.00 to 45.00
Low phos. bundles	41.00 to 42.00
Hvy. axle forge turn.	38.00 to 39.00
Clean cast chem. borings	39.00 to 40.00
RR. steel wheels	46.00 to 47.00
RR. spring steel	46.00 to 47.00
Rails 18 in. and under	52.00 to 53.00
No. 1 machinery cast.	45.00 to 46.00
Mixed yard cast.	40.00 to 41.00
Heavy breakable cast.	39.50 to 40.50
Cast iron carwheels	47.00 to 48.00
Malleable	52.00 to 53.00

Cleveland

No. 1 hvy. melting	$41.00 to $41.50
No. 2 hvy. melting	35.50 to 36.00
No. 1 busheling	41.00 to 41.50
No. 1 bundles	41.00 to 41.50
No. 2 bundles	28.00 to 28.50
Machine shop turn.	30.00 to 30.50
Mixed bor. and turn.	33.00 to 33.50
Shoveling turnings	33.00 to 33.50
Cast iron borings	33.00 to 33.50
Low phos. 2 ft and under	44.00 to 44.50
Steel axle turn.	41.00 to 41.50
Drop forge flashings	41.00 to 41.50
No. 1 RR. hvy. melting	43.50 to 44.00
Rails 3 ft and under	61.50 to 62.50
Rails 18 in. and under	62.50 to 63.50
No. 1 machinery cast.	53.00 to 54.00
RR cast.	53.00 to 54.00
RR. grate bars	43.00 to 44.00
Stove plate	47.00 to 48.00
Malleable	65.00 to 66.00

Youngstown

No. 1 hvy. melting	$43.50 to $44.00
No. 2 hvy. melting	37.50 to 38.00
No. 1 bundles	43.50 to 44.00
No. 2 bundles	$34.50 to $35.00
Machine shop turn.	34.50 to 35.00
Shoveling turnings	36.50 to 37.00
Cast iron borings	36.50 to 37.00
Low phos. plate	46.00 to 46.50

Buffalo

No. 1 hvy. melting	$41.00 to $42.00
No. 2 hvy. melting	37.50 to 38.50
No. 1 busheling	37.50 to 38.50
No. 1 bundles	38.50 to 39.50
No. 2 bundles	36.50 to 37.50
Machine shop turn.	30.00 to 31.00
Mixed bor. and turn.	30.00 to 31.00
Shoveling turnings	32.00 to 34.00
Cast iron borings	30.00 to 31.00
Low phos. plate	42.00 to 43.00
Scrap rails, random lgth.	44.00 to 45.00
Rails 2 ft and under	48.00 to 50.00
RR. steel wheels	47.00 to 48.00
RR. spring steel	47.00 to 48.00
RR. couplers and knuckles	47.00 to 48.00
No. 1 machinery cast.	41.50 to 42.00
No. 1 cupola cast.	38.50 to 39.00
Small Indus. malleable	37.00 to 38.00

Birmingham

No. 1 hvy. melting	$34.50 to $35.00
No. 2 hvy. melting	31.00 to 32.00
No. 2 bundles	29.00 to 30.00
No. 1 busheling	31.00 to 32.00
Machine shop turn.	27.00 to 28.00
Shoveling turnings	29.00 to 30.00
Cast iron borings	25.00 to 26.00
Bar crops and plate	41.00 to 42.00
Structural and plate	41.00 to 42.00
No. 1 RR. hvy. melting	40.00 to 41.00
Scrap rails, random lgth.	43.00 to 44.00
Rerolling rails	48.00 to 49.00
Rails 2 ft and under	48.00 to 49.00
Angles & splice bars	47.00 to 48.00
Std. steel axles	44.00 to 45.00
No. 1 cupola cast.	51.00 to 52.00
Stove plate	46.00 to 47.00
Cast iron carwheels	37.00 to 38.00

St. Louis

No. 1 hvy. melting	$39.00 to $40.00
No. 2 hvy. melting	36.00 to 37.00
No. 2 bundled sheets	34.00 to 35.00
Machine shop turn.	27.50 to 28.50
Shoveling turnings	29.00 to 30.00
Rails, random lengths	50.00 to 51.00
Rails 3 ft and under	54.00 to 56.00
Locomotive tires, uncut	47.00 to 48.00
Angles and splice bars	54.00 to 55.00
Std. steel car axles	76.00 to 78.00
RR. spring steel	49.00 to 50.00
No. 1 machinery cast.	44.00 to 45.00
Hvy. breakable cast.	40.00 to 42.00
Cast iron brake shoes	43.00 to 45.00
Stove plate	38.00 to 39.00
Cast iron car wheels	48.00 to 49.00
Malleable	53.00 to 55.00

New York

Brokers' buying prices per gross ton, on cars:

No. 1 hvy.melting	$32.50 to $33.00
No. 2 hvy. melting	29.00 to 30.00
No. 2 bundles	28.00 to 28.50
Machine shop turn.	22.00 to 23.00
Mixed bor. and turn.	22.00 to 23.00
Shoveling turnings	23.50 to 24.50
Clean cast chem. bor.	34.00 to 35.00
No. 1 machinery cast.	36.00 to 37.00
Mixed yard cast.	34.00 to 35.00
Charging box cast.	34.00 to 35.00
Heavy breakable cast.	33.00 to 34.00
Unstrip. motor blocks	30.00 to 31.00

Boston

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$32.00
No. 2 hvy. melting	$26.00 to 26.50
No. 1 bundles	32.00
No. 2 bundles	$25.50 to $26.00
Machine shop turn.	22.00 to 22.50
Mixed bor. and turn.	22.00 to 22.50
Shoveling turnings	24.50 to 25.00
No. 1 busheling	31.50 to 32.00
Clean cast chem. borings	29.00 to 30.00
No. 1 machinery cast.	35.00 to 36.00
Mixed cupola cast.	32.00 to 32.50
Heavy breakable cast.	30.50 to 31.00
Stove plate	31.00 to 31.50

Detroit

Brokers' buying prices per gross ton, on cars:

No 1 hvy. melting	$37.50 to $38.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 bundles	37.50 to 38.00
New busheling	37.50 to 38.00
Flashings	37.50 to 38.00
Machine shop turn.	25.50 to 26.00
Mixed bor. and turn.	25.50 to 26.00
Shoveling turnings	27.50 to 28.00
Cast iron borings	27.50 to 28.00
Low phos. plate	38.50 to 39.00
No. 1 cupola cast.	42.00 to 43.00
Heavy breakable cast.	35.00 to 36.00
Stove plate	36.00 to 37.00
Automotive cast.	45.00 to 46.00

Cincinnati

Per gross ton, f.o.b. cars:

No. 1 hvy. melting	$39.50 to $40.00
No. 2 hvy. melting	33.50 to 34.00
No. 1 bundles	39.50 to 40.00
No. 2 bundles, black	33.50 to 34.00
No. 2 bundles, mixed	25.50 to 26.00
Machine shop turn.	24.50 to 25.00
Mixed bor. and turn.	26.50 to 27.00
Shoveling turnings	27.50 to 28.00
Cast iron borings	27.50 to 28.00
Low phos. 18 in. under	52.00 to 53.00
Rails, random lengths	51.00 to 52.00
Rails, 18 in. and under	59.00 to 60.00
No. 1 cupola cast.	54.00 to 55.00
Hvy. breakable cast.	46.00 to 47.00
Drop broken cast.	57.00 to 58.00

San Francisco

F.o.b. shipping point:

No. 1 hvy. melting	$23.50
No. 2 hvy. melting	21.50
No. 1 bundles	23.50
No. 2 bundles	19.50
No. 3 bundles	16.50
Machine shop turn.	12.00
Elec. fur. 1 ft and under	36.00
No. 1 RR. hvy. melting	23.50
Scrap rails, random lgth.	23.50
No. 1 cupola cast.	$41.50 to 44.00

Los Angeles

F.o.b. shipping point:

No. 1 hvy. melting	$23.50
No. 2 hvy. melting	21.00
No. 1 bundles	23.50
No. 2 bundles	19.50
No. 3 bundles	16.50
Mach. shop turn.	12.00
Elec. fur. 1 ft and under	38.00
No. 1 RR. hvy. melting	23.50
No. 1 cupola cast.	$42.00 to 45.00

Seattle

No. 1 hvy. melting	$24.00
No. 2 hvy. melting	24.00
No. 1 bundles	22.00
No. 2 bundles	22.00
No. 3 bundles	18.00
Elec. fur. 1 ft and under	$29.00 to 30.00
RR. hvy. melting	25.00
No. 1 cupola cast	35.00
Heavy breakable cast.	25.00

Hamilton, Ont.

No. 1 hvy. melting	$30.00
No. 1 bundles	30.00
No. 2 bundles	29.50
Mechanical bundles	28.00
Mixed steel scrap	26.00
Mixed bor. and turn.	23.00
Rails, remelting	30.00
Rails, rerolling	33.00
Bushelings	24.50
Bush., new fact, prep'd.	29.00
Bush., new fact, unprep'd.	23.00
Short steel turnings	23.00
Cast scrap	40.00

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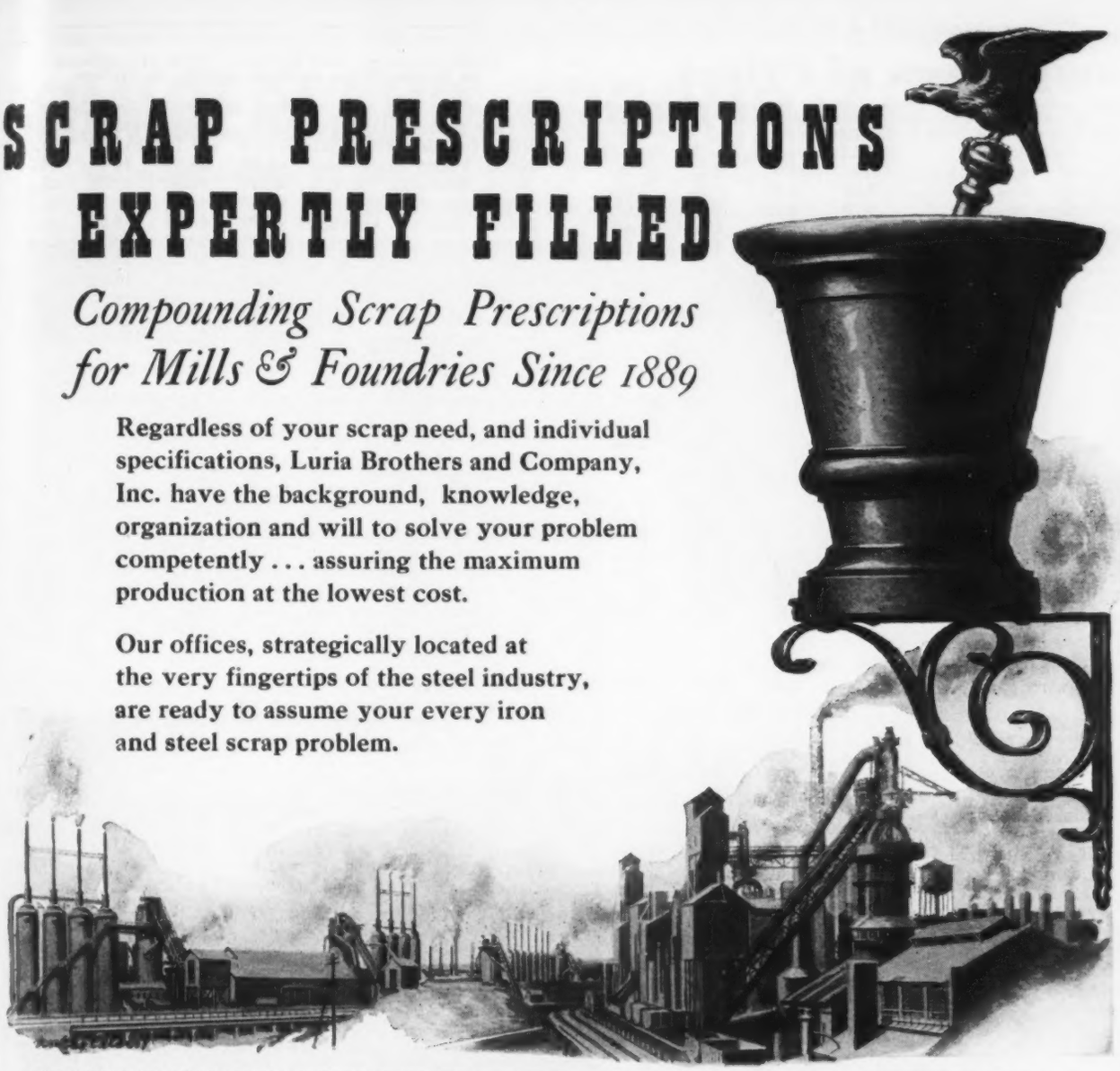

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LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Comparison of Prices

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Flat-Rolled Steel (cents per pound)	Sept.19, 1950	Sept.12, 1950	Aug.22, 1950	Sept.20 1949
Hot-rolled sheets	3.35	3.35	3.35	3.25
Cold-rolled sheets	4.10	4.10	4.10	4.00
Galvanized sheets (10 ga)	4.40	4.40	4.40	4.40
Hot-rolled strip	3.25	3.25	3.25	3.25
Cold-rolled strip	4.21	4.21	4.21	4.038
Plate	3.50	3.50	3.50	3.40
Plates wrought iron	7.85	7.85	7.85	7.85
Stains C-R strip (No. 302)	34.50	34.50	34.50	33.00
Tin and Terneplate: (dollars per base box)				
Tinplate (1.50 lb) cokes.	$7.50	$7.50	$7.50	$7.75
Tinplate, electro (0.50 lb)	6.60	6.60	6.60	6.70
Special coated mfg. ternes	6.35	6.35	6.35	6.65
Bars and Shapes: (cents per pound)				
Merchant bars	3.45	3.45	3.45	3.35
Cold-finished bars	4.145	4.145	4.145	3.995
Alloy bars	3.95	3.95	3.95	3.75
Structural shapes	3.40	3.40	3.40	3.25
Stainless bars (No. 302).	30.00	30.00	30.00	28.50
Wrought iron bars	9.50	9.50	9.50	9.50
Wire: (cents per pound)				
Bright wire	4.50	4.50	4.50	4.15
Rails: (dollars per 100 lb)				
Heavy rails	$3.40	$3.40	$3.40	$3.20
Light rails	3.75	3.75	3.75	3.55
Semifinished Steel: (dollars per net ton)				
Rerolling billets	$54.00	$54.00	$54.00	$52.00
Slabs, rerolling	54.00	54.00	54.00	52.00
Forging billets	63.00	63.00	63.00	61.00
Alloy blooms, billets, slabs	66.00	66.00	66.00	63.00
Wire Rod and Skelp: (cents per pound)				
Wire rods	3.85	3.85	3.85	3.40
Skelp	3.15	3.15	3.15	3.25

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

Pig Iron: (per gross ton)	Sept.19, 1950	Sept.12, 1950	Aug.22, 1950	Sept.20 1949
No. 2, foundry, del'd Phila.	$51.76	$51.76	$51.76	$50.42
No. 2, Valley furnace	46.50	46.50	46.50	46.50
No. 2, Southern Cin'ti	49.08	49.08	49.08	45.47
No. 2, Birmingham	42.38	42.38	42.38	39.38
No. 2, foundry, Chicago†	46.50	46.50	46.50	46.50
Basic del'd Philadelphia.	50.92	50.92	50.92	49.92
Basic, Valley furnace	46.00	46.00	46.00	46.00
Malleable, Chicago†	46.50	46.50	46.50	46.50
Malleable, Valley	46.50	46.50	46.50	46.50
Charcoal, Chicago	68.56	68.56	68.56	68.56
Ferromanganese‡	173.40	173.40	173.40	173.40

†The switching charge for delivery to foundries in the Chicago district is $1 per ton.
‡Average of U. S. prices quoted on Ferroalloy page.

Scrap: (per gross ton)				
Heavy melt'g steel, P'gh.	$43.75	$43.75	$45.75	$29.75
Heavy melt'g steel, Phila.	38.50	38.50	38.50	24.00
Heavy melt'g steel, Ch'go	40.00	40.00	40.50	28.50
No. 1 hy. com. sh't, Det.	37.75	37.50	40.50	23.50
Low phos. Young'n	46.25	46.25	46.75	32.25
No. 1 cast, Pittsburgh	51.75	51.75	48.75	39.50
No. 1 cast, Philadelphia	45.50	44.50	42.50	39.00
No. 1 cast, Chicago	*49.50*	50.50	50.50	42.50
Coke: Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.25	$14.25	$14.25	$14.25
Foundry coke, prompt	16.25	16.25	16.25	15.75
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electro, Conn.	23.80	23.80	22.60	17.625
Copper, Lake, Conn.	24.625	24.625	24.625	17.75
Tin, Straits, New York	$1.02†	$1.0125*	$1.06	$1.03
Zinc, East St. Louis	17.50	17.50	15.00	10.00
Lead, St. Louis	15.80	15.80	13.80	14.925
Aluminum, virgin	17.50	17.50	17.50	17.00
Nickel, electrolytic	51.22	51.22	51.22	42.93
Magnesium, ingot	22.50	22.50	22.50	20.50
Antimony, Laredo, Tex.	32.00	32.00	24.50	38.50

†Tentative. *Revised.

Composite Prices

Starting with the issue of May 12, 1949, the weighted finished steel composite was revised for the years 1941 to date. The weights used are based on the average product shipments for the 7 years 1937 to 1940 inclusive and 1946 to 1948 inclusive. The use of quarterly figures has been eliminated because it was too sensitive. (See p. 139 of May 12, 1949, issue.)

	Finished Steel Base Price	Pig Iron	Scrap Steel
Sept. 19, 1950	3.837¢ per lb.	46.61 per gross ton	$40.75 per gross ton
One week ago	3.837¢ per lb.	46.61 per gross ton	40.75 per gross ton
One month ago	3.837¢ per lb.	46.61 per gross ton	41.58 per gross ton
One year ago	3.705¢ per lb.	45.88 per gross ton	27.42 per gross ton

	Finished Steel Base Price High	Finished Steel Base Price Low	Pig Iron High	Pig Iron Low	Scrap Steel High	Scrap Steel Low
1950	3.837¢ Jan. 3	3.837¢ Jan. 3	$46.61 Aug. 8	$45.88 Jan. 3	$41.58 Aug. 22	$26.25 Jan. 3
1949	3.837¢ Dec. 27	3.3705¢ May 3	46.87 Jan. 18	45.88 Sept. 6	43.00 Jan. 4	19.33 June 28
1948	3.721¢ July 27	3.193¢ Jan. 1	46.91 Oct. 12	39.58 Jan. 6	43.16 July 27	39.75 Mar. 9
1947	3.193¢ July 29	2.848¢ Jan. 1	37.98 Dec. 30	30.14 Jan. 7	42.58 Oct. 28	29.50 May 20
1946	2.848¢ Dec. 31	2.464¢ Jan. 1	30.14 Dec. 10	25.37 Jan. 1	31.17 Dec. 24	19.17 Jan. 1
1945	2.464¢ May 29	2.396¢ Jan. 1	25.37 Oct. 23	23.61 Jan. 2	19.17 Jan. 2	18.92 May 22
1944	2.396¢	2.396¢	$23.61	$23.61	19.17 Jan. 11	15.76 Oct. 24
1943	2.396¢	2.396¢	23.61	23.61	$19.17	$19.17
1942	2.396¢	2.396¢	23.61	23.61	19.17	19.17
1941	2.396¢	2.396¢	$23.61 Mar. 20	$23.45 Jan. 2	$22.00 Jan. 7	$19.17 Apr. 10
1940	2.30467¢ Jan. 2	2.24107¢ Apr. 16	23.45 Dec. 23	22.61 Jan. 2	21.83 Dec. 30	16.04 Apr. 9
1939	2.35367¢ Jan. 3	2.26689¢ May 16	22.61 Sept. 19	20.61 Sept.12	22.50 Oct. 3	14.08 May 16
1938	2.58414¢ Jan. 4	2.27207¢ Oct. 18	23.25 June 21	19.61 July 6	15.00 Nov. 22	11.00 June 7
1937	2.58414¢ Mar. 9	2.32263¢ Jan. 4	32.25 Mar. 9	20.25 Feb. 16	21.92 Mar. 30	12.67 June 9
1936	2.32263¢ Dec. 28	2.05200¢ Mar. 10	19.74 Nov. 24	18.73 Aug. 11	17.75 Dec. 21	12.67 June 8
1935	2.07542¢ Oct. 1	2.06492¢ Jan. 8	18.84 Nov. 5	17.83 May 14	13.42 Dec. 10	10.33 Apr. 29
1932	1.89196¢ July 5	1.83910¢ Mar. 1	14.81 Jan. 5	13.56 Dec. 6	8.50 Jan. 12	6.43 July 5
1929	2.31773¢ May 28	2.26498¢ Oct. 29	18.71 May 14	18.21 Dec. 17	17.58 Jan. 29	14.08 Dec. 8

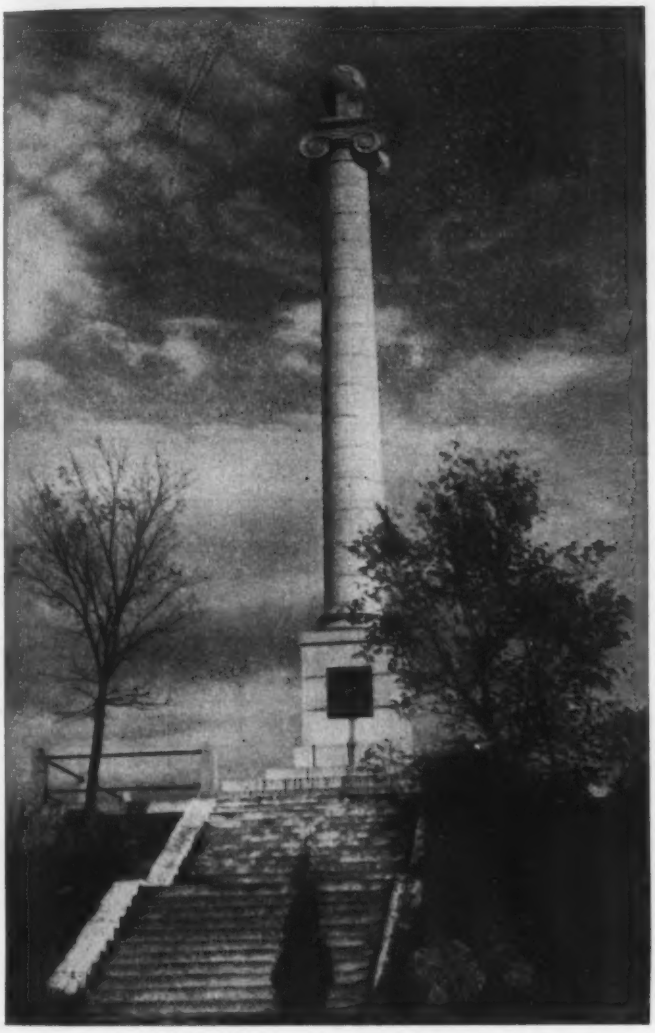
Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing major portion of finished steel shipment. Index recapitulated in Aug. 28, 1941, issue and in May 12, 1949.

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

CUMBERLAND GROUND SHAFTS

We manufacture 8" diameter, 7½", 7", 6½", 6" and intermediate sizes down to and including 1⅛".

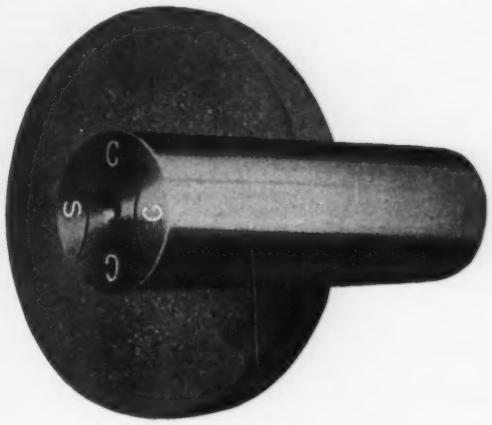


ON THE WEST VIRGINIA SHORE, OVERLOOKING THE POTOMAC RIVER, STANDS THE JAMES RUMSEY MONUMENT

The first practical steamboat in the world was run on the Potomac River a few miles below Cumberland, Maryland.

GEORGE WASHINGTON said in his diary, under date of September 6, 1784: "Remained at Bath all day and was showed the Model of a boat constructed by the ingenious Mr. Rumsey, for ascending rapid currents by mechanism; the principles of this were not only shown, and fully explained to me, but to my very great satisfaction, exhibited in practice in private under the injunction of secrecy——".

At a later date GEORGE WASHINGTON said in his diary: "Spent the afternoon with Mr. Rumsey and then Alexander Hamilton and I rode on to Cumberland, Maryland."



Symbol of Quality

Approximately 100 years after the exhibit of this steamboat, Cumberland began grinding shafts. They found through experience this was the best method by which accurate steel shafts could be produced. These shafts are so carefully ground that they are adapted for mass production where gears, pulleys, sprockets and bearings must slide on the shafts without delay due to filing or fitting.

IMMEDIATE SHAFTS

DISTRIBUTED BY

Baltimore, Maryland—Addison Clarke & Bro.
Boston, Mass.—Hawkridge Brothers Company
Boston, Mass—Brown-Wales Company
Bridgeport, Conn.—Hunter & Havens, Inc.
Buffalo, New York—Jos. T. Ryerson & Son, Inc.
Charlotte, No. Carolina—Edgcomb Steel Co.
Chicago, Ill.—Central Steel & Wire Co.
Cincinnati, Ohio—Jos. T. Ryerson & Son, Inc.
Cleveland, Ohio—The Bissett Steel Company
Dayton, Ohio—Central Steel & Wire Co.
Detroit, Michigan—Central Steel & Wire Co.
Fort Worth, Texas—C. A. Fischer
Hartford, Conn.—Hunter & Havens, Inc.
Indianapolis, Ind.—Tanner & Company
Jersey City, N. J.—Jos. T. Ryerson & Son, Inc.
Lakeland, Fla.—Mine & Mill Supply Co.
Los Angeles, Calif.—Link-Belt Co., Pacific Div.
Louisville, Ky.—Neill-LaVielle Supply Co.
Martinsburg, W. Va.—W. H. Heiston & Son
Montreal, Can.—Drummond, McCall & Co., Ltd.
Milwaukee, Wisconsin—Central Steel & Wire Co.
New Orleans, La.—R. J. Tricon Co.
New York City, N. Y.—Bright Steel Corp.
Oakland, Calif.—Link-Belt Co., Pacific Div.
Philadelphia, Pa.—Charles Bond Company
Philadelphia, Pa.—Horace T. Potts Co.
Pittsburgh, Pa.—McKee-Oliver, Inc.
Portland, Maine—W. L. Blake & Company
Portland, Oregon—Link-Belt Co., Pacific Div.
Providence, R. I.—Congdon & Carpenter Co.
San Francisco, Calif.—Link-Belt Co., Pacific Div.
Seattle, Wash.—Link-Belt Co., Pacific Div.
Spokane, Wash.—Link-Belt Co., Pacific Div.
Toronto, Canada—Drummond, McCall & Co., Ltd.
Worcester, Mass.—Pratt & Inman

CUMBERLAND STEEL COMPANY CUMBERLAND, MARYLAND, U. S. A.
ESTABLISHED 1845 INCORPORATED 1892

IRON AGE

STEEL PRICES

Smaller numbers in price boxes indicate producing companies. For main office locations, see key on facing page.
Base prices at producing points apply only to sizes and grades produced in these areas. Prices are in cents per lb unless otherwise noted. Extras apply.

	Pittsburgh	Chicago	Gary	Cleveland	Canton Massillon	Middletown	Youngstown	Bethlehem	Buffalo	Conshohocken	Johnstown	Sparrows Point	Granite City	Detroit
INGOTS Carbon forging, net ton	$50.00[1]													$50.00[31]
Alloy, net ton	$51.00[1,17]													$51.00[31]
BILLETS, BLOOMS, SLABS Carbon, rerolling, net ton	$53.00[1]	$53.00[1]	$53.00[1]				$57.00[13]		$53.00[3]	$62.00[26]	$53.00[3]			
Carbon forging billets, net ton	$63.00[1]	$63.00[1,4]	$63.00[1,6]	$63.00[4]			$63.00[25]		$63.00[3,4]	$68.00[26]	$63.00[3]			$68.00[31]
Alloy, net ton	$66.00[1,17]	$66.00[1,4]	$66.00[1]		$66.00[4] 42		$66.00[13]	$66.00[3]	$66.00[3,4]	$70.00[26]	$66.00[3]			$66.00[31]
PIPE SKELP	3.15[1]						3.15[1,4]							
WIRE RODS	3.85[2,18]	3.85[2,4,33]	3.85[6]	3.85[2]			3.85[6]				3.85[3]	3.95[3]		
SHEETS Hot-rolled (18 ga. & hvr.)	3.35[1,5,9,15]	3.35[28]	3.35[1,6,8]	3.35[4,5]			3.35[1,4,6] 3.50[13]		3.35[3]	3.60[26]		3.35[3]		3.55[12] 4.15[47]
Cold-rolled	4.10[1,5,7,9,15] 5.10[63]		4.10[1,6,8]	4.10[4,15]		4.10[7]	4.10[4,6]		4.10[3]			4.10[3]	4.30[22]	4.30[12]
Galvanized (10 gage)	4.40[1,9,15]		4.40[1,8]		4.40[4]		4.65[64] 4.75[44]					4.40[3]		
Enameling (12 gage)	4.40[1]		4.40[1,8]	4.40[4]		4.40[7]	4.40[6] 4.90[76]						4.60[22]	4.70[12]
Long ternes (10 gage)	4.80[9,15]		4.80[1]			4.80[7]	4.80[64]							
Hi Str. low alloy, h.r.	5.05[1,5,9]	5.05[1]	5.05[1,6,8]	5.05[4,5]			5.05[1,4,6,13]		5.05[3]	5.05[26]		5.05[3]		5.25[12]
Hi str. low alloy, c.r.	6.20[1,5,9]		6.20[1,6,8]	6.20[4,5]			6.20[4,6,13]		6.20[3]			6.20[3]		6.40[12]
Hi str. low alloy, galv.	6.75[1]											6.75[3]		
STRIP Hot-Rolled	3.25[6,7,9] 3.50[28,41]	3.25[3,66]	3.25[1,6,8]	3.25[5]			3.25[1,4,6] 3.50[13]		3.25[3]	3.50[26]		3.25[3]		3.45[12] 4.05[47]
Cold-rolled	4.15[5,7,9] 4.50[63]	4.30[6] 4.50[66]	4.30[6]	4.15[2,5]		4.15[7]	4.15[4,6,48,49] 4.50[13,40]		4.15[3]			4.15[3]		4.35[12] 4.75[58,61] 4.95[47]
Hi str. low alloy, h.r.	4.95[9]		4.95[1,6,8]	4.95[5]			4.95[1,4,6,13]		4.95[3]	4.95[26]		4.95[3]		5.15[12]
Hi Str. low alloy, c.r.	6.20[9]			6.20[2,5]			6.20[4,6,13]		6.40[3]			6.40[3]		6.40[12]
TINPLATE† Cokes, 1.50-lb base box 1.25 lb, deduct 20¢	$7.50[1,5,9,15]		$7.50[1,6,8]				$7.50[4]					$7.60[3]	$7.70[22]	
Electrolytic 0.25, 0.50, 0.75 lb box	Deduct $1.15, 90¢ and 65¢ respectively from 1.50-lb coke base box price													
BLACKPLATE, 29 gage Hollowware enameling	5.30[1,5,15]		5.30[1,6]				5.30[4]					5.40[3]	5.50[22]	
BARS Carbon steel	3.45[1,5,9]	3.45[1,4,33]	3.45[1,6,8]	3.45[4]	3.45[4]		3.45[1,4,6]		3.45[3,4]		3.45[3]			3.65[12]
Reinforcing‡	3.45[1,5]	3.45[4]	3.45[1,6,8]	3.45[4]			3.45[1,4,6]		3.45[3,4]		3.45[3]	3.45[3]		
Cold-finished	4.10[5] 4.15[2,4,17,52,69,71]	4.15[2,22,69,70]	4.15[4,73,74]	4.15[2,61]	4.15[4,32,52]		4.15[9,49,67]		4.15[70]					4.35[12] 4.30[64]
Alloy, hot-rolled	3.95[1,17]	3.95[1,4,33]	3.95[1,6,8]		3.95[4]		3.95[1,6,25]	3.95[3]	3.95[3,4]		3.95[3]			4.25[12]
Alloy, cold-drawn	4.90[2,17,52,69,71]	4.90[2,22,69,70]	4.90[4,73,74]	4.90[2,61]	4.90[4,42,52]		4.90[6,25,67]	4.90[3]	4.90[2,70]					5.05[64]
Hi str. low alloy, h.r.	5.20[1,5]		5.20[1,6,8]	5.20[4]			5.20[1,6]	5.20[3]	5.20[3]		5.20[3]			5.40[12]
PLATE Carbon steel	3.50[1,5]	3.50[1]	3.50[1,6,8]	3.50[4]			3.50[1,13]		3.50[3]	3.75[26]	3.50[3]	3.50[3]		3.75[12]
Floor Plates	4.55[1]	4.55	4.55[3]	4.55[3]						4.55[26]				
Alloy	4.40[1]	4.40[1]	4.40[1]				4.40[13]			4.55[26]	4.40	4.40[3]		
Hi Str. low alloy	5.35[1,5]	5.35[1]	5.35[1,3]	5.35[4,5]			5.35[6]			5.35[26]	5.35[3]	5.35[3]		5.60[12]
SHAPES, Structural	3.40[1,5,9]	3.40[1,33]	3.40[1,6,8]					3.45[3]	3.45[3]		3.45[3]			
Hi Str. low alloy	5.15[1,5]	5.15[1]	5.15[1,6,8]				5.15[6]	5.20[3]	5.20[3]		5.20[3]			
MANUFACTURERS' WIRE Bright	4.50[2,5,18]	4.50[2,4,12,33,34]		4.50[2,77]			4.50[6]	Kokomo=4.60[30]			4.50[3]	4.60[3]	Duluth=4.50[3] Pueblo=4.75[14]	
PILING, Steel Sheet	4.20[1,9]	4.20[1]							4.20[3]					

Smaller numbers indicate producing companies. See key at right. Prices are in cents per lb unless otherwise noted. Extras apply.

IRON AGE

STEEL PRICES

Kansas City	Houston	Birmingham	WEST COAST Seattle, San Francisco, Los Angeles, Fontana		
			F=$76.00		INGOTS Carbon forging, net ton
	$59.00[83]		F=$77.00		Alloy, net ton
		$53.00[11]	F=$72.00[19]		BILLETS, BLOOMS, SLABS Carbon, rerolling, net ton
	$71.00[83]	$63.00[11]	F=$82.00[19]	Geneva=$63.00[16]	Carbon forging billets, net ton
	$74.00[83]		F=$85.00[19]		Alloy net ton
					PIPE SKELP
	4.25[83]	3.85[11]	SF=4.50[24] LA=4.65[24,62]	Portsmouth=3.85[39] Worcester=4.15[2]	WIRE RODS
		3.35†[11]	SF, LA=4.05[24] F=4.25[19]	Ashland=3.35‡ Niles=3.50[84], Geneva=3.45[16]	SHEETS Hot-rolled (18 ga. & hvr.)
		4.10[11]	SF=5.05[24] F=5.00[19]		Cold-rolled
		4.40†[11]	SF, LA=5.15[24]	Ashland=4.40[7] Kokomo=4.50[39]	Galvanized (10 ga.e)
					Enameling (12 gage)
					Long ternes (10 gage)
		5.05[11]	F=6.74[19]		Hi Str. low alloy, h.r.
			F=7.05[19]		Hi Str. low alloy, c.r.
					Hi Str. low alloy, galv.
3.85[83]	3.65[83]	3.25[11]	SF, LA=4.00[24,62] F=4.40[19], S=4.25[62]	Ashland=3.25[7] Atlanta=3.40[66]	STRIP Hot-rolled
			F=5.75[19] LA=5.85[27]	New Haven=4.85[3], 5.00[69] Trenton=5.00[45]	Cold-rolled
		4.95[11]	F=6.84[19]		Hi Str. low alloy, h. r.
			F=6.95[19]		Hi Str. low alloy, c. r.
		7.80[11]	SF=8.25[24]		TINPLATE Cokes, 1.50-lb base box 1.25 lb, deduct 20¢
Deduct $1.15, 90¢ and 65¢ respectively from 1.50-lb coke base box price					Electrolytic 0.25, 0.50, 0.75 lb box
					BLACKPLATE, 29 gage Hollowware enameling
4.05[83]	3.85[83]	3.45†[11]	SF, LA=4.15[24] LA=4.15[62]	Atlanta=3.60[66]	BARS Carbon steel
4.05[83]	3.85[83]	3.45†[11]	SF, S=4.20[62] F=4.10[19]	Atlanta=3.60[66]	Reinforcing‡
				Putnam, Newark=4.55[69]	Cold-finished
4.55[83]	4.35[83]		LA=5.00[62] F=4.95[19]		Alloy, hot-rolled
				Newark,[69] Worcester[2]=5.20 Hartford=5.20[4]	Alloy, cold-drawn
		5.20[11]	F=6.25[19]		Hi Str. low alloy, h.r.
	3.90[83]	3.50†[11]	F=4.10[19] S=4.40[62] Geneva=3.50[16]	Claymont=3.90[39] Coatesville=3.90[21] Harrisburg=4.25[38]	PLATE Carbon steel
				Harrisburg=5.25[38]	Floor plates
			F=5.40[19]	Coatesville=4.80[21]	Alloy
		5.35[11]	F=5.95[19]	Geneva=5.35[16]	Hi Str. low alloy
4.00[83]	3.80[83]	3.40[11]	SF=3.95[62] LA=4.00[24,62]	Phoenixville=4.25[56] Geneva=3.40[16]	SHAPES, Structural
		5.15[11]	F=4.00[19] S=4.05[62]	Fontana=5.75[19] Geneva=5.15[16]	Hi Str. low alloy
5.10[83]	4.90[83]	4.50†[11]	SF, LA=5.45[24,62]	Portsmouth=4.50[39] Worcester=4.80[2]	MANUFACTURERS' WIRE Bright

Notes: †Special coated mfg ternes deduct $1.15 from 1.50-lb coke base box price. Can-making quality blackplate, 55 to 128-lb, deduct $1.90 from 1.50-lb coke base box. ‡Straight lengths only from producer to fabricator.

KEY TO STEEL PRODUCERS

With Principal Offices

1 Carnegie-Illinois Steel Corp., Pittsburgh
2 American Steel & Wire Co., Cleveland
3 Bethlehem Steel Co., Bethlehem
4 Republic Steel Corp., Cleveland
5 Jones & Laughlin Steel Corp., Pittsburgh
6 Youngstown Sheet & Tube Co., Youngstown
7 Armco Steel Corp., Middletown, Ohio
8 Inland Steel Co., Chicago
9 Weirton Steel Co., Weirton, W. Va.
10 National Tube Co., Pittsburgh
11 Tennessee Coal, Iron & R. R. Co., Birmingham
12 Great Lakes Steel Corp., Detroit
13 Sharon Steel Corp., Sharon, Pa.
14 Colorado Fuel & Iron Corp., Denver
15 Wheeling Steel Corp., Wheeling, W. Va.
16 Geneva Steel Co., Salt Lake City
17 Crucible Steel Co. of America, New York
18 Pittsburgh Steel Co., Pittsburgh
19 Kaiser Steel Corp., Oakland, Calif.
20 Portsmouth Div., Detroit Steel Corp., Detroit
21 Lukens Steel Co., Coatesville, Pa.
22 Granite City Steel Co., Granite City, Ill.
23 Wisconsin Steel Co., South Chicago, Ill.
24 Columbia Steel Co., San Francisco
25 Copperweld Steel Co., Glassport, Pa.
26 Alan Wood Steel Co., Conshohocken, Pa.
27 Calif. Cold Rolled Steel Corp., Los Angeles
28 Allegheny Ludlum Steel Corp., Pittsburgh
29 Worth Steel Co., Claymont, Del.
30 Continental Steel Corp., Kokomo, Ind.
31 Rotary Electric Steel Co., Detroit
32 Laclede Steel Co., St. Louis
33 Northwestern Steel & Wire Co., Sterling, Ill.
34 Keystone Steel & Wire Co., Peoria, Ill.
35 Central Iron & Steel Co., Harrisburg, Pa.
36 Carpenter Steel Co., Reading, Pa.
37 Eastern Stainless Steel Corp., Baltimore
38 Washington Steel Corp., Washington, Pa.
39 Jessop Steel Co., Washington, Pa.
40 Blair Strip Steel Co., New Castle, Pa.
41 Superior Steel Corp., Carnegie, Pa.
42 Timken Steel & Tube Div., Canton, Ohio
43 Babcock & Wilcox Tube Co., Beaver Falls, Pa.
44 Reeves Steel & Mfg. Co., Dover, Ohio
45 John A. Roebling's Sons Co., Trenton, N. J.
46 Simonds Saw & Steel Co., Fitchburg, Mass.
47 McLouth Steel Corp., Detroit
48 Cold Metal Products Co., Youngstown
49 Thomas Steel Co., Warren, Ohio
50 Wilson Steel & Wire Co., Chicago
51 Sweet's Steel Co., Williamsport, Pa.
52 Superior Drawn Steel Co., Monaca, Pa.
53 Tremont Nail Co., Wareham, Mass.
54 Firth Sterling Steel & Carbide Corp., McKeesport, Pa.
55 Ingersoll Steel Div., Chicago
56 Phoenix Iron & Steel Co., Phoenixville, Pa.
57 Fitzsimmons Steel Co., Youngstown
58 Stanley Works, New Britain, Conn.
59 Universal-Cyclops Steel Corp., Bridgeville, Pa.
60 American Cladmetals Co., Carnegie, Pa.
61 Cuyahoga Steel & Wire Co., Cleveland
62 Bethlehem Pacific Coast Steel Corp., San Francisco
63 Follansbee Steel Corp., Pittsburgh
64 Niles Rolling Mill Co., Niles, Ohio
65 Atlantic Steel Co., Atlanta
66 Acme Steel Co., Chicago
67 Joslyn Mfg. & Supply Co., Chicago
68 Detroit Steel Corp., Detroit
69 Wyckoff Steel Co., Pittsburgh
70 Bliss & Laughlin, Inc., Harvey, Ill.
71 Columbia Steel & Shafting Co., Pittsburgh
72 Cumberland Steel Co., Cumberland, Md.
73 La Salle Steel Co., Chicago
74 Monarch Steel Co., Inc., Hammond, Ind.
75 Empire Steel Co., Mansfield, Ohio
76 Mahoning Valley Steel Co., Niles, Ohio
77 Oliver Iron & Steel Co., Pittsburgh
78 Pittsburgh Screw & Bolt Co., Pittsburgh
79 Standard Forging Corp., Chicago
80 Driver Harris Co., Harrison, N. J.
81 Detroit Tube & Steel Div., Detroit
82 Reliance Div., Eaton Mfg. Co., Massillon, Ohio
83 Sheffield Steel Corp., Kansas City
84 Plymouth Steel Co., Detroit

STAINLESS STEELS

Base prices, in cents per pound, f.o.b. producing point

Product	301	302	303	304	316	321	347	410	416	430
Ingots, rerolling	13.75	14.50	16.00	15.50	23.75	19.25	21.00	12.25	14.25	12.50
Slabs, billets, rerolling	18.00	19.25	21.25	20.25	31.25	25.50	27.75	16.60	19.50	16.25
Forg. discs, die blocks, rings	32.00	32.00	34.50	33.50	50.50	38.00	42.50	26.00	26.50	26.50
Billets, forging	25.75	25.75	27.75	27.00	40.50	30.50	34.25	21.00	21.50	21.50
Bars, wire, structurals	30.00	30.00	32.50	31.50	47.50	35.50	40.00	24.50	25.00	25.00
Plates	32.00	32.00	34.00	34.00	50.50	39.50	44.00	26.00	26.50-27.00	26.50
Sheets	39.00	39.00	41.00	41.00	54.50	47.00	51.50	34.50	35.00	37.00
Strip, hot-rolled	25.50	27.00	31.25	29.00	47.25	35.75	40.00	22.50	29.25	23.00
Strip, cold-rolled	32.00	34.50	38.00	36.50	56.50	46.00	50.00	28.50	35.00	29.00

STAINLESS STEEL PRODUCING POINTS—*Sheets:* Midland, Pa., 17; Brackenridge, Pa., 28; Butler, Pa., 7; McKeesport, Pa., 1; Washington, Pa., 38,39; Baltimore, 37; Middletown, Ohio, 7; Massillon, Ohio, 4; Gary, 1; Bridgeville, Pa., 59; New Castle, Ind., 55; Ft. Wayne, Ind., 67; Lockport, N. Y., 46.

Strip: Midland, Pa., 17; Cleveland, 2; Carnegie, Pa., 41; McKeesport, Pa., 54; Reading, Pa., 36; Washington, Pa., 38; W. Leechburg, Pa., 28; Bridgeville, Pa., 59; Detroit, 47; Massillon, Canton, Ohio, 4; Middletown, Ohio, 7; Harrison, N. J., 80; Youngstown, 48; Lockport, N. Y., 46; New Britain, Conn., 58; Sharon, 13; Butler, Pa., 7.

Bars: Baltimore, 7; Duquesne, Pa., 1; Munhall, Pa., 1; Reading, Pa., 36; Titusville, Pa., 59; Washington, Pa., 39; McKeesport, Pa., 1, 54; Bridgeville, Pa., 59; Dunkirk, N. Y., 28; Massillon, Ohio, 4; Chicago, 1; Syracuse, N. Y., 17; Watervliet, N. Y., 28; Waukegan, Ill., 2; Lockport, N. Y., 46; Canton, Ohio, 42; Ft. Wayne, Ind., 67.

Wire: Waukegan, Ill., 2; Massillon, Ohio, 4; McKeesport, Pa., 54; Bridgeport, Conn., 44; Ft. Wayne, Ind., 67; Trenton, N. J., 45; Harrison, N. J., 80; Baltimore, 7; Dunkirk, 28.

Structurals: Baltimore, 7; Massillon, Ohio, 4; Chicago, 1, 67; Watervliet, N. Y., 28; Bridgeport, Conn., 44.

Plates: Brackenridge, Pa., 28; Butler, Pa., 7; Chicago, 1; Munhall, Pa., 1; Midland, Pa., 17; New Castle, Ind., 55; Lockport, N. Y., 46; Middletown, 7; Washington, Pa., 39; Cleveland, Massillon, 4.

Forged discs, die blocks, rings: Pittsburgh, 1, 17; Syracuse, 17; Ferndale, Mich., 28.

Forging billets: Midland, Pa., 17; Baltimore, 7; Washington, Pa., 39; McKeesport, 54; Massillon, Canton, Ohio, 4; Watervliet, 28; Pittsburgh, Chicago, 1.

ELECTRICAL SHEETS

22 gage, HR cut lengths, f.o.b. mill

	Cents per lb.
Armature	6.20
Electrical	6.70
Motor	*7.95
Dynamo	8.75
Transformer 72	9.30
Transformer 65	9.85
Transformer 58	10.55
Transformer 52	11.35

PRODUCING POINTS—Beech Bottom, W. Va., 15; Brackenridge, Pa., 28; Follansbee, W. Va., 63; Granite City, Ill., 22*; add 0.20¢; Indiana Harbor, Ind., 8; Mansfield, Ohio, 75; Niles, Ohio, 64, 76; Vandergrift, Pa., 1; Warren, Ohio, 4; Zanesville, Ohio, 7.

MERCHANT WIRE PRODUCTS

To dealers, f.o.b. mill	*Base Column 100 lb*	*Pittsburg, Calif.*
Standard & coated nails*	106	125§
Woven wire fence†	116	139
Fence posts, carloads††	116	...
Single loop bale ties	113	137
Galvanized barbed wire**	126	146
Twisted barbless wire	126	146

* Pgh., Chi., Duluth; Worcester, 6 columns higher; Houston, 8 columns higher; Kansas City, 12 columns higher. † 15½ gage and heavier. ** On 80 rod spools, in carloads. †† Duluth, Joliet; Johnstown, 112.

	Base per 100 lb	*Pittsburg, Calif.*
Merch. wire annealed‡	$5.35	$6.30
Merch. wire, galv.‡	5.60	6.55
Cut nails, carloads‡‡	6.75	...

‡ Add 30¢ at Worcester; 20¢ at Chicago; 10¢ at Sparrows Pt.
‡‡ Less 20¢ to jobbers.
§ Torrance 126.

PRODUCING POINTS — *Standard, Coated or galvanized nails, woven wire fence, bale ties, and barbed wire:* Alabama City, Ala., 4; Atlanta, 65; Aliquippa, Pa., (except bale ties), 5; Bartonville, Ill. (except bale ties), 34; Chicago, 4; Donora, Pa., 2; Duluth, 2; Fairfield, Ala., 11; Johnstown, Pa. (except bale ties), 3; Joliet, Ill., 2; Kokomo, Ind., 30; Minnequa, Colo., 14; Monessen, Pa. (except bale ties), 18; Pittsburg, Calif., 24; Portsmouth, Ohio, 20; Rankin, Pa. (except bale ties), 2; Sparrows Point (except woven fence), 3; Sterling, Ill., 33; San Francisco (except nails and woven fence), 14; Torrance, Calif. (nails only). 24; Worcester (nails only), 2; Houston (except bale ties), 83; Kansas City, 83.

Fence Posts: Duluth, 2; Johnstown, Pa., 3; Joliet, Ill., 2; Minnequa, Colo., 14; Moline, Ill., 4; Williamsport, Pa., 51.

Cut nails: Wheeling, W. Va., 15; Conshohocken, Pa., 26; Warehame, Mass., 53.

RAILS, TRACK SUPPLIES

F.o.b. mill

Standard rails, 100 lb and heavier, No. 1 quality, per 100 lb	$3.40
Joint bars, per 100 lb	4.40
Light rails, per 100 lb	3.75

	Base Price cents per lb
Track spikes†	5.60
Axles	5.25
Screw spikes	8.60
Tie plates	4.20
Pittsburg, Torr., Calif.; Seattle	4.35
Track bolts, untreated	8.85
Track bolts, heat treated, to railroads	9.10

†Kansas City, 5.85¢.

PRODUCING POINTS—*Standard rails:* Bessemer, Pa., 1; Ensley, Ala., 11; Gary, 1; Indiana Harbor, Ind., 8; Lackawanna, N. Y., 3; Minnequa, Colo., 14; Steelton, 3.

Light rails: All the above except Indiana Harbor and Steelton, plus Fairfield, Ala., 11; Johnstown, 3; Minnequa, 14.

Joint bars: Bessemer, Pa., 1; Fairfield, Ala., 11; Indiana Harbor, Ind., 8; Joliet, Ill., 1; Lackawanna, N. Y., 3; Steelton, Pa., 3; Minnequa, Colo., 14.

Track spikes: Indiana Harbor, Ind., 6, 8; Lebanon, Pa., 3; Minnequa, Colo., 14; Pittsburgh, 5; Chicago, 4; Struthers, 6; Youngstown, 4.

Track bolts: Lebanon, Pa., 3; Minnequa, Colo., 14; Pittsburgh, 77, 78.

Axles: Indiana Harbor, Ind., 79; Johnstown, Pa., 3.

Tie plates: Fairfield, Ala., 11; Gary, 1; Indiana Harbor, Ind., 8; Lackawanna, N. Y., 3; Pittsburg, Calif., 24; Seattle, 62; Steelton, Pa., 3; Torrance, Calif., 24; Minneona, Colo., 14.

Numbers after producing points correspond to steel producers. See key on Steel Price page.

PIPE AND TUBING

Base discounts, f.o.b. mills
Base price about $200.00 per net ton

Standard, T & C

Steel, Buttweld*	*Black*	*Galv*
⅛-in.	40½ to 38½	21 to 19
¼-in.	43½ to 41½	25 to 23
⅜-in.	46 to 44	28 to 26
½-in.	46½ to 44½	28½ to 26½
¾-in.	47 to 45	29 to 27
1-in.	47½ to 45½	29½ to 27½
1¼ to 3-in.	48 to 46	30 to 28
Steel, lapweld		
2-in.	38	19½
2½ to 3-in.	42	23½
3½ to 6-in.	43 to 40	24½ to 21½
Steel, seamless		
2-in.	36	17½
2½ to 3-in.	39	20½
3½ to 6-in.	41	22½
Wrought iron, buttweld		
⅛-in.	+26½	+56
¼-in.	+16½	+45
⅜ & ½-in.	+10½	+36
¾-in.	+ 4½	+32½
1-in.	+ 4	+32
Wrought iron, lapweld		
2-in.	+13½	+40
2½ to 3½-in.	+11	+35½
4-in.	+ 6	+29½
4½ to 8-in.	+ 8	+31
9 to 12-in.	+18	+40½

Extra Strong, Plain Ends

Steel, buttweld		
⅛-in.	39½ to 37½	21½ to 19½
¼-in.	43½ to 41½	25½ to 23½
⅜-in.	45½ to 43½	28½ to 26½
½-in.	46 to 44	29 to 27
¾-in.	46½ to 44½	29½ to 27½
1-in.	47 to 45	30 to 29
1¼ to 3-in.	47½ to 45½	30½ to 28½
Steel, lapweld		
2-in.	37	19½
2½ to 3-in.	42	24½
3½ to 6-in.	44½ to 41½	27 to 24
Steel, seamless		
2-in.	35	17½
2½ to 3-in.	38	21½
3½ to 6-in.	42½	25
Wrought iron, buttweld		
⅛-in.	+22	+50
¼-in.	+15½	+43
⅜ to 2 in.	+ 5½	+32
Wrought iron, lapweld		
2-in.	+10½	+36½
2½ to 4-in.	+ 1	+25
4½ to 6-in.	+ 5	+29½
7 & 8-in.	list	+24½
9 to 12-in.	+11½	+32½

For threads only, buttweld, lapweld and seamless pipe, one point higher discount (lower price) applies. For plain ends, buttweld, lapweld and seamless pipe 3-in. and smaller, three points higher discount (lower price) applies, while for lapweld and seamless 3½-in. and larger four points higher discount (lower price) applies. On buttweld lapweld steel pipe, jobbers are granted a discount of 5 pct.
* Fontana, Calif., deduct 11 points from figures in left columns.

BOILER TUBES

Seamless steel and electric welded commercial boiler tubes and locomotive tubes, minimum wall. Prices per 100 ft at mill in carload lots, cut lengths 10 to 24 ft inclusive.

OD in.	gage BWG	Seamless H.R.	Seamless C.R.	Electric H.R.	Electric Weld C.D.
2	13	$20.61	$24.24	$19.99	23.51
2½	12	27.71	32.58	26.88	31.60
3	12	30.82	36.27	29.90	35.18
3½	11	38.52	45.38	37.36	43.99
4	10	47.32	56.25	46.39	54.56

WAREHOUSE PRICES

Base prices, f.o.b. warehouse, dollars per 100 lb.
(Metropolitan area delivery, add 20¢ to base price except Birmingham, San Francisco, Cincinnati, New Orleans, St. Paul (*), add 15¢; Philadelphia, add 25¢).

CITIES	SHEETS			STRIP		PLATES	SHAPES	BARS		ALLOY BARS			
	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled		Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled, A 4615 As-rolled	Hot-Rolled, A 4140 Ann.	Cold-Drawn, A 4615 As-rolled	Cold-Drawn, A 4140 Ann.
Baltimore	5.15	6.39[1]	6.85[2] 6.65	5.59–5.59[11]	....	5.40–6.04[11]	5.69	5.59	6.19	9.89	9.99	11.12	11.49
Birmingham*	5.15[10]	5.95	6.15[7]	5.10	....	5.40	5.25	5.10	6.88	....	....	....	....
Boston	5.75	6.55[20]	6.94[6] 7.14	5.70	6.90–6.95	6.08	5.75	5.60	6.19–6.69	9.70–9.97	8.50–10.00	11.15	11.45
Buffalo	5.15	5.95	6.94	5.41	7.27	5.65	5.35	5.15	5.75	9.80	9.90	11.05	11.35
Chicago	5.15	6.20	6.85	5.10	6.30	5.40	5.25	5.10	5.65	9.25	9.55	10.70	11.00
Cincinnati*	5.42–5.97	5.99–6.24	6.39	5.35	....	5.79	5.64	5.35–5.54	5.96–6.25	9.60–9.81	9.90–10.11	11.05–11.26	11.35–11.56
Cleveland	5.15	5.95	7.00–7.10	5.24	6.35	5.52	5.37	5.12	5.75	9.36	9.66	10.81	11.11
Detroit	5.33	6.08–6.33	7.09	5.49	6.43–6.80	5.59–5.79	5.64–5.68	5.39	5.91	9.56	9.86	11.01	11.31
Houston	6.00	....	....	6.10	....	6.00	5.95	6.10	7.80	10.35–10.45	10.50–10.60	11.50	11.95–12.10
Indianapolis	....	....	....	....	7.38	....	....	....	6.15	....	....	....	....
Kansas City	5.75	6.55	7.45	5.70	6.95	6.00	5.85	5.70	6.35	9.95	10.15	11.30	11.60
Los Angeles	5.90	7.45	8.00[2]	5.95	8.70[16]	6.00	5.90	5.90	7.55	10.75	10.75	12.45	12.75
Memphis	5.93	6.68	....	5.98	6.80–8.51	6.08	5.93	5.68	6.51	....	....	....	....
Milwaukee	5.29	6.09	6.94–8.99	5.24	6.32	5.54	5.39	5.24	5.89	9.39	9.69	10.84	11.14
New Orleans*	5.50[1]	6.75 6.85[1]	....	5.55[1]	6.80 6.90[1]	5.65	5.55[1]	5.55[1]	6.75 6.80	....	....	....	....
New York	5.55	6.89[1]	7.20[2]	5.84	6.78	5.90	5.65	5.75	6.44	9.60	9.90	11.05	11.35
Norfolk	6.10[13]	7.00	....	6.30[13]	....	6.15[13]	6.20[13]	6.15[13]	7.20[13]	....	....	....	....
Philadelphia*	6.05	6.20–6.35	6.85[2] 7.25	5.65	6.29	5.65	5.45	5.60	6.21	9.35	9.65	10.80	11.10
Pittsburgh	5.15	5.95	6.60	5.20	5.95–6.00	5.35	5.25	5.10	5.75	9.25	9.55	10.70	11.00
Portland	6.60–7.10[1]	8.40[2]	....	6.85[9]	....	6.40[9]	6.50	6.45–6.45[9]	8.60[14]	12.00[18]	11.60[18]	....	....
Salt Lake City	5.85	6.70	....	7.45	8.75	6.10[3]	5.90	7.35[5]	8.75	....	....	....	....
San Francisco*	6.20	7.60[2]	7.65[2]	6.15	7.85[16]	6.10	6.00	6.00	7.55	10.75	10.75	12.45	12.75
Seattle	6.60[4]	8.15[2]	8.40[2]	6.85[4]	....	6.35[4]	6.20[4]	6.35[4]	8.50[14]	....	11.60[18]	....	13.60[19]
St. Louis	5.48	6.28	7.18	5.43	7.30	5.73	5.58	5.43	6.08	9.58	9.88	11.03	11.33
St. Paul*	5.71	6.51	7.41	5.66	6.15–6.82	5.96	5.81	5.66	6.31	9.81	10.11	11.26	11.56

BASE QUANTITIES: (*Standard unless otherwise keyed on prices.*)
Hot-rolled sheets and strip, hot rolled bars and bar shapes, structural shapes, plate, galvanized sheets and cold-rolled sheets: 2000 to 9999 lb. Cold-finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb.

All HR products may be combined to determine quantity bracket. All galvanized sheets may be combined to determine quantity bracket. CR sheets may not be combined with each other or with galv. sheets to determine quantity bracket.

Exceptions:
(1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 300 to 4999 lb; (4) 300 to 9999 lb; (5) 2000 to 5999 lb; (6) 1000 lb and over; (7) 500 to 1499 lb; (8) 400 lb and over; (9) 400 to 9999 lb; (10) 500 to 9999 lb; (11) 400 to 3999 lb; (12) 450 to 3749 lb; (13) 400 to 1999 lb; (14) 1500 lb and over; (15) 1000 to 9999 lb; (16) 6000 lb and over; (17) up to 1999 lb; (18) 1000 to 4999 lb; (19) 1500 to 3499 lb; (20) CR sheets may be combined for quantity; (21) 3 to 24 bundles.

PIG IRON PRICES

Dollars per gross ton. Delivered prices do not include 3 pct tax on freight.

PRODUCING POINT PRICES

Producing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem	48.00	48.50	49.00	49.50	.....
Birmingham	41.88	42.38	.....	.....	.....
Buffalo	46.00	46.50	47.00	.....	.....
Chicago	46.00	46.50	46.50	47.00	.....
Cleveland	46.00	46.50	46.50	47.00	51.00
Daingerfield, Tex.	41.50	42.00	42.00	.....	.....
Duluth	46.00	46.50	46.50	47.00	.....
Erie	46.00	46.50	46.50	47.00	.....
Everett	.....	50.50	51.00	.....	.....
Granite City	47.90	48.40	48.90	.....	.....
Ironton, Utah	46.00	46.50	.....	.....	.....
Pittsburgh	46.00*	.....	.....	47.00	.....
Neville Island	49.00	49.50	49.50	50.00	.....
Geneva, Utah	46.00	46.50	.....	.....	.....
Sharpsville	46.00	46.50	46.50	47.00	.....
Steelton	48.00	48.50	49.00	49.50	54.00
Struthers, Ohio	46.00	.....	.....	.....	.....
Swedeland	50.00	50.50	51.00	51.50	.....
Toledo	46.00	46.50	46.50	47.00	.....
Troy, N. Y.	48.00	48.50	49.00	.....	54.00
Youngstown	46.00	46.50	46.50	47.00	.....

DELIVERED PRICES (BASE GRADES)

Consuming Point	Producing Point	Rail Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Boston	Everett	$0.50 Arb.	.....	50.50	51.00	.....	.....
Boston	Steelton	6.90	.....	.....	.....	.....	60.90
Brooklyn	Bethlehem	4.29	.....	52.79	53.29	53.79	.....
Cincinnati	Birmingham	6.70	48.58	49.08	.....	.....	.....
Jersey City	Bethlehem	2.63	.....	51.13	51.63	52.13	.....
Los Angeles	Geneva-Ironton	7.70	53.70	54.20	.....	.....	.....
Mansfield	Cleveland-Toledo	3.33	49.33	49.83	49.83	50.33	54.33
Philadelphia	Bethlehem	2.39	50.39	50.89	51.39	51.89	.....
Philadelphia	Swedeland	1.44	51.44	51.94	52.44	52.94	.....
Philadelphia	Steelton	3.09	51.09	51.59	52.09	52.59	57.09
Rochester	Buffalo	2.63	48.63	49.13	49.63	.....	.....
San Francisco	Geneva-Ironton	7.70	53.70	54.20	.....	.....	.....
Seattle	Geneva-Ironton	7.70	53.70	54.20	.....	.....	.....
St. Louis	Granite City	0.75 Arb.	48.65	49.15	49.65	.....	.....
Syracuse	Buffalo	3.58	49.58	50.08	50.58	.....	.....

* *Monessen, $51.00.*

Producing point prices are subject to switching charges; silicon differential (not to exceed 50c per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct for foundry iron); phosphorus differentials, a reduction of 38c per ton for phosphorus content of 0.70 pct and over; manganese differentials, a charge not to exceed 50c per ton for each 0.50 pct manganese content in excess of 1.00 pct. $2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and $1 per ton extra for each additional 0.25 pct nickel.

silvery iron (blast furnace) silicon 6.01 to 6.50 pct C/L per g.t., f.o.b. Jackson, Ohio—$57.00; f.o.b. Buffalo, $58.25. Add $1.00 per ton for each additional 0.50 pct Si up to 17 pct. Add 50c per ton for each 0.50 pct Mn over 1.00 pct. Add $1.00 per ton for 0.75 pct or more P. Bessemer ferrosilicon prices are $1.00 per ton above silvery iron prices of comparable analysis.

Charcoal pig iron base price for low phosphorus $60.00 per gross ton, f.o.b. Lyle, Tenn. Delivered Chicago, $68.56. High phosphorus charcoal pig iron is not being produced.

BOLTS, NUTS, RIVETS, SET SCREWS

Consumer Prices

(Bolts and nuts, f.o.b. mill Pittsburgh, Cleveland, Birmingham or Chicago) Base discount

Machine and Carriage Bolts

	Pct Off List Less Case	C.
½ in. & smaller x 6 in. & shorter	27	38
9/16 & ⅝ in. x 6 in. & shorter	29	40
¾ in. & larger x 6 in. & shorter	26	37
All diam, longer than 6 in.	22	34
Lag, all diam, longer than 6 in.	28	39
Lag, all diam x 6 in. & shorter	30	41
Plow bolts	40	—

Nuts, Cold Punched or Hot Pressed

(Hexagons or Square)

½ in. and smaller	25 37
9/16 to ⅝ in.	33 35
¾ to 1½ in. inclusive	23 35
1⅝ in. and larger	16 29

Semifinished Hexagon Nuts

(Less case lots)

	Pct Off List Reg	Hvy	Lt
½ in. and smaller	41	35	41
9/16 to ⅝ in.	36	30	36
¾ to 1½ in.	31	27	33
1⅝ in. and larger	21	17	..

In full case lots, 15 pct additional discount.

Stove Bolts

	Pct Off List
Packaged, steel, plain finish	63
Packaged, plated finish	50
Bulk, plain finish**	69*

* Discounts apply to bulk shipments in not less than 15,000 pieces of a size and kind where length is 3-in. and shorter; 5000 pieces for lengths longer than 3-in. For lesser quantities, packaged price applies.

** Zinc, Parkerized, cadmium or nickel plated finishes add 6¢ per lb net. For black oil finish, add 2¢ per lb net.

Large Rivets

(½ in. and larger) Base per 100 lb

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham, Lebanon, Pa. $7.25

Small Rivets

(7/16 in. and smaller) Pct Off List

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham 43

Cap and Set Screws

(In bulk)	Pct Off List
Hexagon head cap screws, coarse or fine thread, ¼ in. thru ⅝ in. x 6 in., SAE 1020, bright	60
¼ in. through ⅝ in. x 6 in. and shorter high C heat treated	54
Milled studs	23
Flat head cap screws, listed sizes	24
Fillister head cap, listed sizes	43
Set screws, sq head, cup point, 1 in. diam and smaller x 6 in. and shorter	59

C-R SPRING STEEL

Base per pound f.o.b. mill

0.26 to 0.40 carbon	4.50¢
0.41 to 0.60 carbon	5.95¢
0.61 to 0.80 carbon	6.55¢
0.81 to 1.05 carbon	8.50¢
1.06 to 1.35 carbon	10.80¢

Worcester, add 0.30¢.

LAKE SUPERIOR ORES

(51.50% Fe; natural content, delivered lower lake ports)

	Per gross ton
Old range, bessemer	$8.10
Old range, nonbessemer	7.95
Mesabi, bessemer	7.85
Mesabi, nonbessemer	7.70
High phosphorus	7.70

After Jan. 25, 1950, increases or decreases in Upper Lake rail freight, dock handling charges and taxes are for buyers' account.

ELECTRODES

Cents per lb, f.o.b. plant, threaded electrodes with nipples, unboxed

Diam. in in.	Length in in.	Cents Per lb
GRAPHITE		
17, 18, 20	60, 72	17.00¢
8 to 16	48, 60, 72	17.00¢
7	48, 60	18.64¢
6	48, 60	19.95¢
4, 5	40	20.48¢
3	40	21.53¢
2½	24, 30	23.05¢
2	24, 30	24.15¢
CARBON		
40	100, 110	7.65¢
35	65, 110	7.65¢
30	65, 84, 110	7.65¢
24	72 to 104	7.65¢
20	84, 90	7.65¢
17	60, 72	7.65¢
14	60, 72	8.16¢
10, 12	60	8.42¢
8	60	8.67¢

CLAD STEEL

Base prices, cents per pound, f.o.b. mill

	Plate	Sheet
Stainless-carbon		
No. 304, 20 pct, Coatesville, Pa. (21)	*28.00	
Washgtn, Pa. (39)	*28.00	
Claymont, Del. (29)	*26.50	
Conshohocken, Pa. (26)		*24.00
New Castle, Ind. (55)	*26.50	*25.50
Nickel-carbon 10 pct, Coatesville (21)	31.00	
Inconel-carbon 10 pct, Coatesville (21)	39.00	
Monel-carbon 10 pct, Coatesville (21)	32.00	
No. 302 Stainless-copper-stainless, Carnegie, Pa. (60)		75.00
Aluminized steel sheets, hot dip, Butler, Pa. (7)		7.75

* Includes annealing and pickling, or sandblasting.

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	$1.00
18	4	1	—	5	$1.565
18	4	2	—	—	$1.13
1.5	4	1.5	8	—	71.5¢
6	4	2	6	—	76.5¢

High-carbon-chromium	57.5¢
Oil hardened manganese	32¢
Special carbon	29.5¢
Extra carbon	24.5¢
Regular carbon	21¢

Warehouse prices on and east of Mississippi are 3¢ per lb higher. West of Mississippi, 5¢ higher.

COKE

	Net Ton
Furnace, beehive (f.o.b. oven) Connellsville, Pa.	$14.00 to $14.50
Foundry, beehive (f.o.b. oven) Connellsville, Pa.	$16.00 to $16.50
Foundry, oven coke	
Buffalo, del'd	$24.00
Chicago, f.o.b.	21.00
Detroit, f.o.b.	21.65
New England, del'd	23.40
Seaboard, N. J., f.o.b.	22.00
Philadelphia, f.o.b.	21.25
Swedeland, Pa., f.o.b.	21.20
Painesville, Ohio, f.o.b.	21.90
Erie, del'd	$21.04 to 21.25
Cleveland, del'd	22.62
Cincinnati, del'd	22.71
St. Paul, f.o.b.	21.00
St. Louis, del'd	22.13
Birmingham, del'd	20.20

FLUORSPAR

Washed gravel fluorspar, f.o.b. cars, Rosiclare, Ill. Base price, per ton net; Effective CaF, content:

70% or more	$39.00
60% or less	36.00

Prices Continued on Page 152

REFRACTORIES

	(F.o.b. works) Carloads, Per 1000
Fire Clay Brick	
First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5)	$86.00
No. 1 Ohio	80.00
Sec. quality, Pa., Md., Ky., Mo., Ill.	80.00
No. 2 Ohio	72.00
Ground fire clay, net ton, bulk (except Salina, Pa., add $1.50)	14.00
Silica Brick	
Mt. Union, Pa., Ensley, Ala.	$86.00
Childs, Pa.	90.00
Hays, Pa.	91.00
Chicago District	95.00
Western Utah and Calif.	101.00
Super Duty, Hays, Pa., Athens, Tex., Chicago	106.00
Silica cement, net ton, bulk, Eastern (except Hays, Pa.)	15.00
Silica cement, net ton, bulk, Hays, Pa.	17.00
Silica cement, net ton, bulk, Ensley, Ala.	16.00
Silica cement, net ton, bulk, Chicago District	16.00
Silica cement, net ton, bulk, Utah and Calif.	22.50
Chrome Brick	*Per Net Ton*
Standard chemically bonded, Balt., Chester	$72.00
Magnesite Brick	
Standard, Baltimore	$94.00
Chemically bonded, Baltimore	83.00
Grain Magnesite	*St. ⅜-in. grain*
Domestic, f.o.b. Baltimore, in bulk fines removed	$56.00 to $57.00
Domestic, f.o.b. Chewelah, Wash., in bulk	33.00
in sacks	38.00
Dead Burned Dolomite	
F.o.b. producing points in Pennsylvania, West Virginia and Ohio, per net ton, bulk Midwest, add 10¢; Missouri Valley, add 20¢	$13.00

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.i.f. New York, ocean bags	7.4¢ to 9.0¢
Canadian sponge iron, del'd, in East	10.00¢
Domestic sponge iron, 98+% Fe, carload lots	9.0¢ to 15.0¢
Electrolytic iron, annealed, 99.5+% Fe	36.0¢ to 39.5¢
Electrolytic iron unannealed, minus 325 mesh, 99+% Fe	48.5¢
Hydrogen reduced iron, minus 300 mesh, 98+% Fe	63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 micron, 98%, 99.8+% Fe	70.0¢ to $1.35
Aluminum	29.00¢
Brass, 10 ton lots	27.75¢ to 31.25¢
Copper, electrolytic	9.25¢ plus metal value
Copper, reduced	9.75¢ plus metal value
Cadmium, 100-199 lb	$2.95
Chromium, electrolytic, 99% min., and quantity	$3.50
Lead	6.5¢ plus metal value
Manganese	52.00¢
Molybdenum, 99%	$2.65
Nickel, unannealed	75.5¢
Nickel, annealed	81.5¢
Nickel, spherical, unannealed	78.5¢
Silicon	34.00¢
Solder powder	6.5¢ to 8.5¢ plus met. value
Stainless steel, 302	75.00¢
Tin	11.00¢ plus metal value
Tungsten, 99%	$2.90
Zinc, 10 ton lots	20.50¢ to 23.85¢

CAST IRON WATER PIPE

	Per net ton
6 to 24-in., del'd Chicago	$91.80 to $95.30
6 to 24-in., del'd N. Y.	91.00 to 92.00
6 to 24-in., Birmingham	78.00 to 82.50
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipment; rail and water shipment less	$108.50 to $113.00

Class "A" and gas pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

FERROALLOYS

Ferromanganese

78-82% Mn. maximum contract base price, gross ton, lump size.

F.o.b. Birmingham	$174
F.o.b. Niagara Falls, Alloy, W. Va., Welland, Ont.	$172
F.o.b. Johnstown, Pa.	$174
F.o.b. Sheridan, Pa.	$172
F.o.b. Etna, Clairton, Pa.	$175

$2.00 for each 1% above 82% Mn, penalty, $2.15 for each 1% below 78%.

Briquets—Cents per pound of briquet, delivered, 66% contained Mn.

Carload, bulk	10.45
Ton lots	12.05

Spiegeleisen

Contract prices gross ton, lump, f.o.b.

	16-19% Mn 3% max. Si	19-21% Mn 3% max. Si
Palmerton, Pa.	$69.00	$70.00
Pgh. or Chicago	65.00	66.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.

96% min. Mn, 0.2% max. C, 1% max. Si, 2% max. Fe.

Carload, packed	29.75
Ton lots	31.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads	28
Ton lots	30
Less ton lots	32

Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50. Contract price, carloads, lump, bulk, delivered, per lb. of contained Mn. 18.15¢

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, delivered.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	25.25	27.10	28.30
0.10% max. C	24.75	26.60	27.80
0.15% max. C	24.25	26.10	27.30
0.30% max. C	23.75	25.60	26.80
0.50% max. C	23.25	25.10	26.30
0.75% max. C, 7.00% max. Si	20.25	22.10	23.30

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C. For 2% max. C, deduct 0.2¢.

Carload bulk	8.95
Ton lots	10.60
Briquet, contract basis carlots, bulk delivered, per lb of briquet	10.30
Ton lots	11.90

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $77.00 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls N. Y., $80.00. Add $1.00 per ton for each additional 0.50% Si up to and including 18%. Add $1.00 for each 0.50% Mn over 1%.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.

96% Si, 2% Fe	20.70
97% Si, 1% Fe	21.10

Silicon Briquets

Contract price, cents per pound of briquet bulk, delivered, 40% Si, 1 lb Si briquets.

Carload, bulk	6.30
Ton lots	7.90

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump, bulk, carloads, delivered.

25% Si	17.00	75% Si	13.50
50% Si	11.30	85% Si	14.65
90-95% Si			16.50

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots	2.40	3.30	4.55

Prices Continued on Page 154

Ferrochrome

Contract prices, cents per pound, contained Cr, lump size, bulk, in carloads, delivered. (65-72% Cr, 2% max Si.)

0.06% C	28.75	0.20% C	27.75
0.10% C	28.25	0.50% C	27.50
0.15% C	28.00	1.00% C	27.35
2.00% C			27.00
65-69% Cr, 4-9% C			29.50
62-66% Cr, 4-6% C, 6-9% Si.			31.35

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% N.

S. M. Ferrochrome

Contract price, cents per pound, chromium contained, lump size, delivered.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

Carloads	21.60
Ton lots	23.75
Less ton lots	25.25

Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.

Carloads	27.75
Ton lots	30.05
Less ton lots	31.35

Chromium Metal

Contract prices, per lb chromium contained packed, delivered, ton lots. 97% min. Cr, 1% max. Fe.

0.20% Max. C.	$1.09
0.50% max. C	1.05
.00 min. C	1.04

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-49%, C 0.05% max.) Contract price, carloads, f.o.b. Niagara Falls, freight allowed; lump 4-in. x down, bulk 2-in. x down, 20.50¢ per lb of contained Cr plus 11.30¢ per lb of contained Si.

Bulk 1-in. x down, 20.65¢ per lb contained Cr plus 11.50¢ per lb contained Si.

Calcium-Silicon

Contract price per lb of alloy, lump, delivered.

30-33% Ca, 60-65% Si, 3.00% max. Fe.

Carloads	17.90
Ton lots	21.00
Less ton lots	22.50

Calcium-Manganese—Silicon

Contract prices, cents per lb of alloy, lump, delivered.

16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	19.25
Ton lots	21.55
Less ton lots	22.55

CMSZ

Contract price, cents per pound of alloy, delivered.

Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.

Alloy 5: 50.56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.

Ton lots	19.75
Less ton lots	21.00

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. V-5: 38-42% Cr, 17-19% Si, 8-11% Mn.

Ton lots	15.75¢
Less ton lots	17.00¢

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed	17.00¢
Ton lots to carload packed	18.00¢
Less ton lots	19.50¢

SMZ

Contract price, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, ½ in. x 12 mesh.

Ton lots	17.25
Less ton lots	18.50

Other Ferroalloys

Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.
- Carload ..... 8.65¢
- Ton lots ..... 10.05¢

Calcium molybdate, 45-40%, f.o.b. Langeloth, Pa., per pound contained Mo ..... 96¢

Ferrocolumbium, 50-60%, 2 in x D, contract basis, delivered, per pound contained Cb.
- Ton lots $3.50
- Less ton lots 3.55

Ferro-Tantalum-columbium, 20% Ta, 40% Cb, 0.30 C. Contract basis, delivered, ton lots, 2 in. x D, per lb of contained Cb plus Ta $3.67

Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo $1.13

Ferrophosphorus, electrolytic, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $3 unitage, per gross ton $65.00
10 tons to less carload 75.00

Ferrotitanium, 40%, regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.28

Ferrotitanium, 25%, low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.40
Less ton lots $1.45

Ferrotitanium, 15 to 19%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton $167.00

Ferrotungsten, standard, lump or ¼ x down, packed, per pound contained W, 5 ton lots, delivered $2.25

Ferrovanadium, 35-55%, contract basis, delivered, per pound, contained V.
- Openhearth $2.90
- Crucible 3.00
- High speed steel (Primos) 3.10

Molybdic oxide, briquets or cans, per lb contained Mo, f.o.b. Langeloth, Pa. ..... 95¢
bags, f.o.b. Washington, Pa., Langeloth, Pa. ..... 94¢

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound
- Carload, bulk, lump ..... 11.00¢
- Ton lots, bulk, lump ..... 11.50¢
- Less ton lots, lump ..... 12.25¢

Vanadium pentoxide, 88-92% V_2O_5 contract basis, per pound contained V_2O_5 ..... $1.20

Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.
- Ton lots ..... 21.00¢

Zirconium, 12-15%, contract basis, lump, delivered, per lb of alloy.
- Carload, bulk ..... 6.60¢

Boron Agents

Contract prices per lb of alloy, del.

Borosil, f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B $4.25

Bortam, f.o.b. Niagara Falls
- Ton lots, per pound ..... 45¢
- Less ton lots, per pound ..... 50¢

Carbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4.5-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed.
- Ton lots, per pound ..... 10.00¢

Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D. Ton lots $1.20
F.o.b. Wash., Pa.; 100 lb, up
- 10 to 14% B ..... .75
- 14 to 19% B 1.20
- 19% min. B 1.50

Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over.
- No. 1 ..... 93¢
- No. 6 ..... 63¢
- No. 79 ..... 45¢

Manganese—Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, delivered.
- Ton lots $1.46
- Less ton lots 1.57

Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered.
- Less ton lots $1.80

Silcaz, contract basis, delivered.
- Ton lots ..... 45.00¢

The Clearing House

NEWS OF USED, REBUILT AND SURPLUS MACHINERY

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Electrical Items Move—The demand for electrical equipment has picked up considerably during the past 5 to 6 weeks in the Pittsburgh area. There have been many inquiries from aircraft companies. Items currently moving well are engine-generator sets, motor-generator sets, plating sets, and large transformers.

Automatics Gone—No good modern machine tool is without a home in the Cleveland district at the moment. The market is particularly active for automatic chucking machines, boring mills, centerless grinders, toolroom equipment, and large-size turret lathes. Automatics have practically disappeared from the used machinery market.

MDNA–Recommended Price Controls For Sales of Used Machine Tools*

Class	Built	Rebuilt Price** (In Pct)	As Is Price** (In Pct)
I	Jan. 1, 1940 to present	95	70
II	Jan. 1, 1935 to Dec. 31, 1939	90	65
III	Jan. 1, 1930 to Dec. 31, 1934	80	55
IV	Jan. 1, 1925 to Dec. 31, 1929	70	45
V	Previous to Jan. 1925	60	35

* All classifications and prices listed except last, (V), are same as OPA prices on used machine tools as of Mar. 1, 1941.

** Prices given are percentages of similar new machine tool prices in effect at time of price control adoption. These controls were recommended by the MDNA board of directors on Aug. 14, 1950.

THE IRON AGE

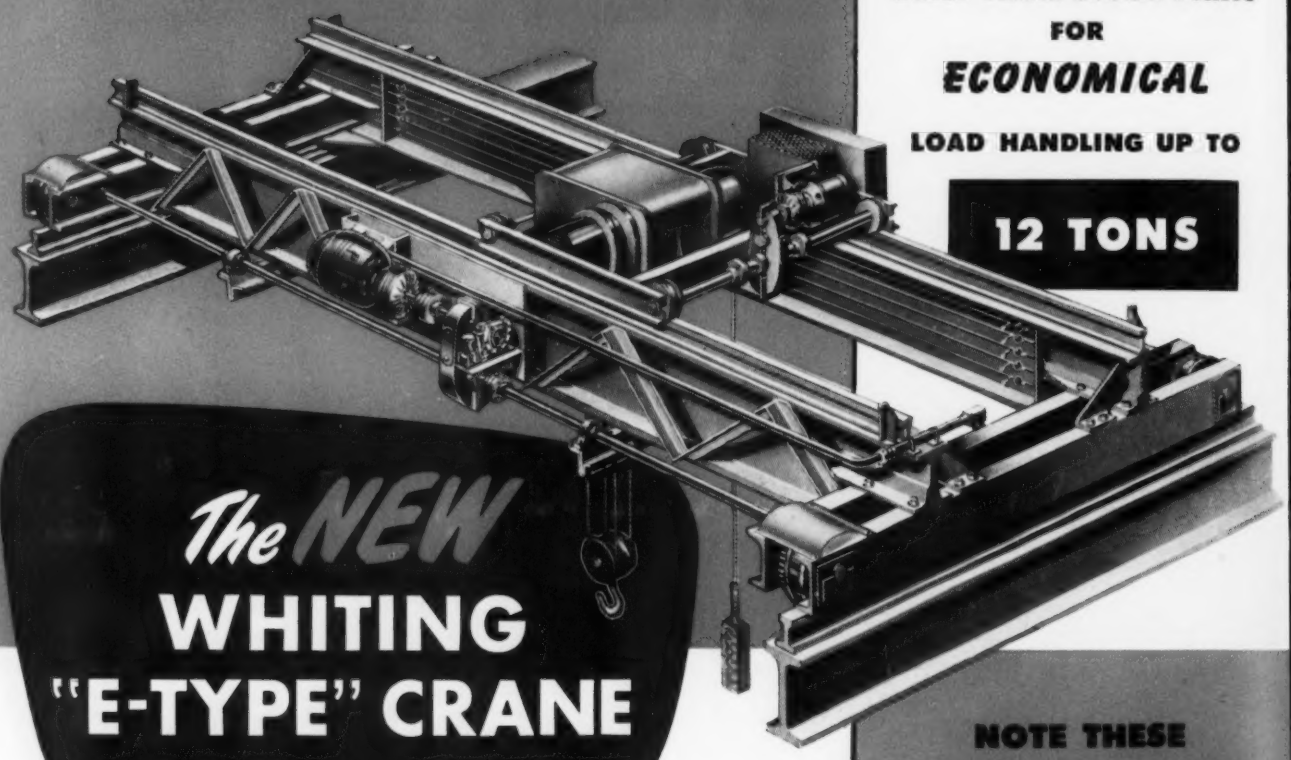
THE NATIONAL METALWORKING WEEKLY September 28, 1950

NOW! A LOW-COST CRANE

For Intermittent Duty

BUILT FROM STOCK PARTS FOR *ECONOMICAL* LOAD HANDLING UP TO

12 TONS



The NEW WHITING "E-TYPE" CRANE

Here is a crane that makes possible lower-cost materials handling in intermittent-duty applications. The new Whiting "E-Type" Crane costs substantially less than conventional units, because it is made from stock parts which can be built in quantity and assembled without special engineering. Yet, it is built with the same care and precision as the heavy-duty, custom-engineered Whiting Cranes, and has many of their quality features.

Whiting "E-Type" Cranes are recommended for places where lifting is intermittent, and where high-speed lifting and racking are not essential. It is built in capacities up to 12 tons and in spans from 20 to 60 feet, with either floor or cab control.

Bulletin 300-75 describes this unit completely. Write for your copy.

WHITING CORPORATION

15601 Lathrop Avenue, Harvey, Illinois

Offices in Chicago, Cincinnati, Detroit, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, and St. Louis. Representatives in other principal cities. Canadian Subsidiary: Whiting Corporation (Canada) Ltd., Toronto, Ontario. Export Department: 30 Church St., New York 7, N. Y.

NOTE THESE QUALITY FEATURES

Magnetic Control permits push-button operation from the floor; protects motors against overload.

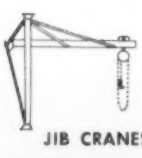
Fluid Drive protects motor and drive from shock. Greatly reduces swinging of the load.

Anti-Friction Bearings All moving parts mounted on ball or roller bearings.

Higher Lift provided by the low headroom hoist. Makes more overhead space available for stacking and storage.

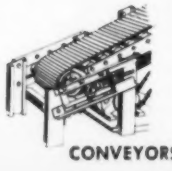
WHITING *OVERHEAD TRAVELING* CRANES

HOISTS



JIB CRANES

"TRAMBEAM" MONORAIL SYSTEMS



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Also: Foundry Equipment • Railroad Equipment • Metal-Working Machinery • Swenson Evaporators and Spray Dryers

Pure Zinc is locked on BETHANIZED WIRE

Zinc armor that stays put . . . that's bethanized wire. Whether you bend it, twist it, wrap it — even draw it — the zinc won't crack or peel off. The exceptional ductility of this protective zinc jacket makes it ideal for uses where severe forming must be performed. And bethanized wire is tops when you need stubborn resistance to corrosion.

New users are always amazed by the uniformity of the coating, the perfect bond between 99.9-pct-pure zinc and steel. Our highly-developed electrolytic process deposits pure zinc atom by atom on the steel wire, locking on this bright finish so smoothly, so tightly.

Bethanized wire may be the answer to one of your wire problems . . . whether you need hard- or soft-temper wire, standard or extra-heavy coating weights. We suggest you get complete details from one of our wire specialists. The nearest Bethlehem sales office will give your request prompt attention.

SOME TYPICAL USES OF BETHANIZED WIRE:

Coil springs
Telephone wire — Barbed wire
Solid clothes line
Twisted wire brushes
Coat hanger hooks
Wheel spokes
Cotter pins — Chain-link fence
Core for aluminum conductor (A.C.S.R.)
Helical springs
Bottle-crate dividers
Conveyor-belt fabrics — Wire rope
Fine wire items
Pump chain — Baskets
Snow fence — Bookbinding
Welded mesh — Flyscreens

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GEORGE T. HOOK
Publisher

B. H. Hayes
Production Manager

O. L. Johnson
Director of Research

Charles T. Post
Manager Circulation and Promotion

Editorial, Advertising and Circulation Offices
100 E. 42nd St., New York 17, N.Y., U.S.A.

Regional Business Managers

B. L. Herman
Philadelphia 39
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Peirce Lewis
Detroit 2
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C. H. Ober
New York 17
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Robert F. Blair
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J. M. Spackman
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Paul Bachman
West Hartford 7
62 La Salle Rd.

R. Raymond Kay
Los Angeles 28
2420 Cheremoya Ave.

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THE IRON AGE

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Special Article

Two year trial proves that better cores can be produced at lower costs by electronic baking. Savings come from use of synthetic binders, faster baking.—p. 67.

Issue Highlights

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Stainless brazed joints for gas turbine service must not fail at 2000°F. These joints can be made with dry H_2 atmosphere, special methods and a new alloy.—p. 74.

Stress relief of 347 stainless depends more on temperature than time. From 932° to 1652°F, relief is same with material stressed to 39 or 75 pct of yield strength.—p. 78.

Pipelines planned or under construction will stretch 25,000 miles and need about 6 million tons of steel. Most are for natural gas.—p. 89.

A fatality involving an overloaded steel-hauling truck may force a showdown on Pennsylvania weight law enforcement. Truckers may snub Pennsylvania steel business.—p. 91.

Government-protected steel industries of South America are expanding. They are hampered by high costs but now find the opportune time to grow.—p. 92.

Pressure for higher wages has caught up with the steel industry. Steel companies are expected to get together with the union for wage rise conferences.—p. 96.

Coming Next Week

New machinability determination method uses a graphical plot of microscopic tool wear measurements. It is accurate and faster than conventional tests.

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New Haven Boom—The used machinery business in this area has revived to the extent that dealers report their activity to be from 60 to 100 pct better than the comparable period last year. From the middle of July these dealers have had an increased demand for late type screw machines, grinders, turret lathes, and toolroom items. In their opinion, the reason that business here is up is because manufacturers in this area are stockpiling.

New Orleans NISA—S. J. Stewart of S. J. Stewart Electric Co. was recently elected president of the New Orleans chapter of the National Industrial Service Assn. Harry Mentrup of Nola Electric Co. and Charles W. Hiers of New Orleans Armature Works were elected vice-president and secretary-treasurer, respectively.

Electrical Items Move—The demand for electrical equipment has picked up considerably during the past 5 to 6 weeks in the Pittsburgh area. There have been many inquiries from aircraft companies. Items currently moving well are engine-generator sets, motor-generator sets, plating sets, and large transformers.

Automatics Gone—No good modern machine tool is without a home in the Cleveland district at the moment. The market is particularly active for automatic chucking machines, boring mills, centerless grinders, toolroom equipment, and large-size turret lathes. Automatics have practically disappeared from the used machinery market.

MDNA–Recommended Price Controls For Sales of Used Machine Tools*

Class	Built	Rebuilt Price** (In Pct)	As Is Price** (In Pct)
I	Jan. 1, 1940 to present	95	70
II	Jan. 1, 1935 to Dec. 31, 1939	90	65
III	Jan. 1, 1930 to Dec. 31, 1934	80	55
IV	Jan. 1, 1925 to Dec. 31, 1929	70	45
V	Previous to Jan. 1925	60	35

* All classifications and prices listed except last, (V), are same as OPA prices on used machine tools as of Mar. 1, 1941.

** Prices given are percentages of similar new machine tool prices in effect at time of price control adoption. These controls were recommended by the MDNA board of directors on Aug. 14, 1950.